CompactLogix Selection Guide

1769-L31
1769-L32C, 1769-L35CR
1769-L32E, 1769-L35E

Rockwell Automation

Logix Controllers Comparison

Common Characteristics	1756 ControlLogix	1769 CompactLogix	1789 SoftLogix5800	1794 FlexLogix	PowerFlex 700S with DriveLogix
controller tasks: • continuous • periodic • event	• 32 tasks (only 1 continuous) • event tasks: supports all event triggers	• 1769-L35x: 8 tasks • 1769-L32x: 6 tasks • 1769-L31: 4 tasks • only 1 continuous • event tasks: supports consumed tag trigger and EVENT instruction	• 32 tasks (only 1 continuous) • event tasks: supports all event triggers, plus outbound and Windows events	• 8 tasks (only 1 continuous) • event tasks: supports consumed tag trigger and EVENT instruction	• 8 tasks (only 1 continuous) • event tasks: supports axis and motion event triggers
user memory	1756-L55M12: 750 Kbytes 1756-L55M13: 1.5 Mbytes 1756-L55M14: 3.5 Mbytes 1756-L55M16: 7.5 Mbytes 1756-L55M22: 750 Kbytes 1756-L55M23: 1. 5 Mbytes 1756-L55M24: 3.5Mbytes 1756-L61: 2 Mbytes 1756-L62: 4 Mbytes 1756-L63: 8 Mbytes	1769-L31: 512 Kbytes 1769-L32x: 750 Kbytes 1769-L35x: 1.5 Mbytes	1789-L10: 2 Mbytes 3 slots no motion 1789-L30: 64 Mbytes 5 slots 1789-L60: 64 Mbytes 16 slots	1794-L34: 512 Kbytes	256 Kbytes 768 Kbytes with memory expansion
nonvolatile user memory	1756-L55M12: none 1756-L55M13: none 1756-L55M14: none 1756-L55M16: none 1756-L55M22: yes 1756-L55M23: yes 1756-L55M24: yes 1756-L6x: CompactFlash	CompactFlash	none	yes	yes (expansion memory)
built-in communication ports	1 port RS- 232 serial (DF1 or ASCII)	• 1769-L31 has 2 RS-232 ports (one DF1 only, other DF1 or ASCII) • 1769-L32C, -L35CR has 1 ControlNet port and 1 RS-232 serial port (DF1 or ASCII) • 1769-L32E, -L35E has 1 EtherNet/IP port and 1 RS-232 serial port (DF1 or ASCII)	depends on personal computer	• 1 port RS-232 serial (DF1 or ASCII) • 2 slots for 1788 communication cards	• 1 port RS-232 serial (DF1 or ASCII) • 1 slot for 1788 communication cards
communication options (these options have specific products and profiles for their platform - other options are available via 3rd party products and generic profiles)	EtherNet/IP ControlNet DeviceNet Data Highway Plus Universal Remote I/ O serial Modbus via ladder routine DH-485 SynchLink	EtherNet/IP ControlNet DeviceNet serial Modbus via ladder routine DH-485	EtherNet/IP ControlNet DeviceNet serial	EtherNet/IP ControlNet DeviceNet serial Modbus via ladder routine DH-485	EtherNet/IP ControlNet DeviceNet serial Modbus via ladder routine DH-485
connections	64 over ControlNet (48 recommended) 128 over EtherNet/IP	32 over ControlNet 32 over EtherNet/IP	64 over ControlNet (48 recommended) EtherNet/IP limited by type and number of cards	32 over ControlNet 32 over EtherNet/IP	32 over ControlNet 32 over EtherNet/IP
controller redundancy	full redundancy support	not applicable	not applicable	controller hot backup via DeviceNet	not applicable
native I/O	1756 ControlLogix I/O	1769 Compact I/O	none	1794 FLEX I/O 1797 FLEX Ex I/O	1794 FLEX I/O 1797 FLEX Ex I/O
simple motion	stepper servo via DeviceNet analog ac drive	stepper servo via DeviceNet analog ac drive	stepper servo via DeviceNet analog ac drive	stepper servo via DeviceNet analog ac drive	stepper servo via DeviceNet analog ac drive
integrated motion	SERCOS interface analog interface with options: • quadrature encoder input • LDT input • SSI input	not applicable	SERCOS interface analog interface with options: • quadrature encoder input • LDT input • SSI input	not applicable	1 full servo 1 feedback axis
mounting and/or installation options	1756 chassis	panel mount DIN rail	none	panel mount DIN rail	embedded
programming languages	• relay ladder • structured text • function block • sequential function chart	• relay ladder • structured text • function block • sequential function chart	• relay ladder • structured text • function block • sequential function chart • external routines (Windows DLLs developed using C/C++)	• relay ladder • structured text • function block • sequential function chart	• relay ladder • structured text • function block • sequential function chart

Logix Platforms

Allen-Bradley Logix platforms provide a single integrated control architecture for sequential, drives, motion, and process control.

The Logix platforms provide a common control engine, programming software environment, and communication support across multiple hardware platforms. All Logix controllers operate with a multitasking, multiprocessing operating system and support the same set of instructions in multiple programming languages. One RSLogix 5000 programming software package programs all Logix controllers. And, as part of the Integrated Architecture, all Logix controllers offer the benefits of the Common Industrial Protocol (CIP) to communicate via EtherNet/IP, ControlNet, and DeviceNet networks.

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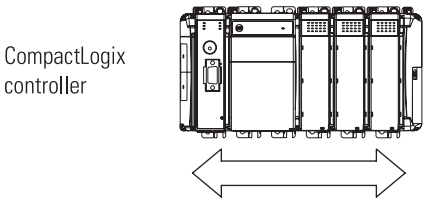
CompactLogix System Overview

What's New in Version 15:

- *support for 1769-L32C and 1769-L35CR controllers*
- *support for 1769-IQ32T, 1769-OV32T, 1769-IF4I, 1769-OF4CI, 1769-OF4VI, 1769-ARM, 1769-ASCII, 1769-SM2 modules*
- *discontinued support for 1769-L20 and 1769-L30 controllers*
- *discontinued support for Windows NT*

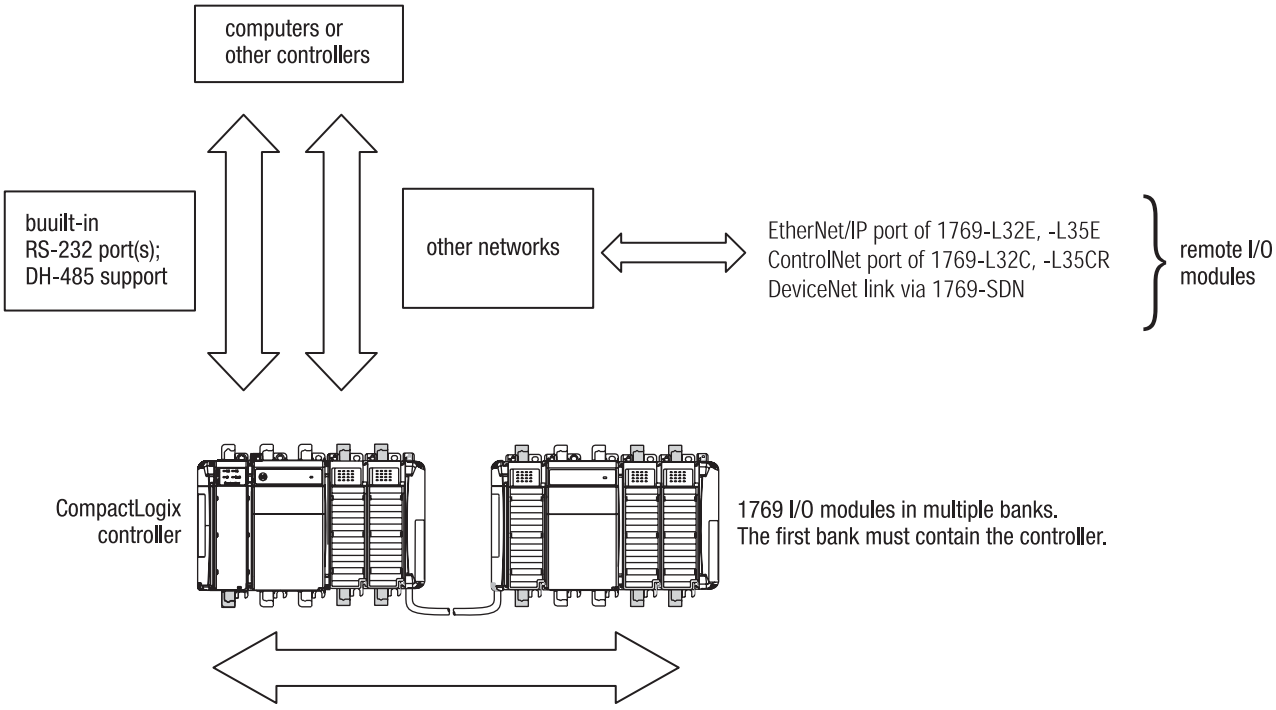
CompactLogix is designed to provide a Logix solution for low-end to medium applications. Typically, these applications are machine-level control applications that require limited I/O quantities and limited communications capabilities. The 1769-L31 controller offfers two serial ports. The 1769-L32C and 1769-L35CR controllers offer an integrated ControlNet port. The 1769-L32E and 1769-L35E controllers offer an integrated EtherNet/IP port.

A simple system can consist of only a stand-alone controller in a single bank of I/O modules and simple communication.



Multiple controllers can communicate across networks and share data.

- multiple controllers joined across networks
- I/O in multiple platforms that is distributed in many locations and connected in as many three different banks of I/O modules

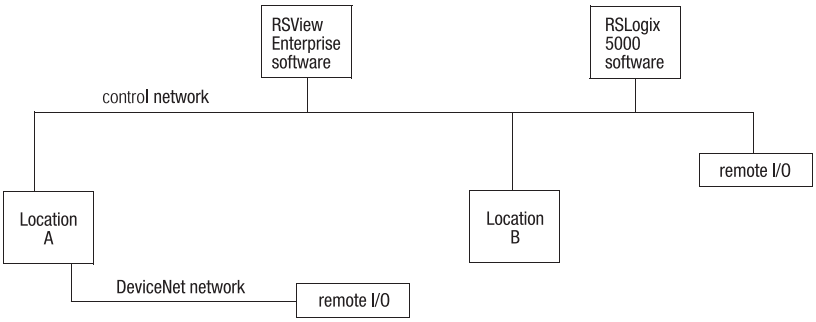


Layout the System

As you layout a system configuration, determine the network configuration and the placement of components in each location. Decide at this time whether each location will have its own controller.

Use the CompactLogix system to distribute control among different locations. You can remotely control I/O and field devices from a central CompactLogix controller over EtherNet/IP, ControlNet, or DeviceNet.

For example, this system layout defines Location A and Location B, which each require a unique CompactLogix controller. Location A and Location B each have their own I/O modules. Location A also has some remote DeviceNet I/O devices, so that location will need a DeviceNet scanner, such as a 1769-SDN. Either EtherNet/IP or ControlNet can serve as the supervisory network to interlock Location A and Location B.



For Location A, if the supervisory network is EtherNet/IP, use a 1769-L32E, -L35E controller because it can share data with the other devices on EtherNet/IP and can simultaneously support EtherNet/IP and DeviceNet communications. Or if the supervisory network is ControlNet, use a 1769-L32C, -L35CR controller.

For Location B, use any CompactLogix controller. If the control network is an EtherNet/IP network, a 1769-L31 controller with a 1761-NET-ENI module offers cost savings over a 1769-L35E controller.

Specify a System

Follow these steps as you specify your CompactLogix system:

✓	Step	See	
	1 Select I/O devices Use a spreadsheet to record: • location of the device • number of points needed • appropriate catalog number • number of points available per module • number of modules	I/O module specifications Wiring systems Place I/O modules How I/O modules operate Select controller ownership	page 5 page 10 page 11 page 14 page 14
	2 Select communication modules To the I/O spreadsheet, add the number and type of required communication modules.	Network overview EtherNet/IP specifications ControlNet specifications DeviceNet specifications Serial specifications DH-485 specifications	page 15 page 17 page 19 page 20 page 21 page 22
	3 Select controllers Select the appropriate controller based on: • required controller tasks • type and number of I/O points needed • distributed I/O via EtherNet/IP or ControlNet • type and number of communication interfaces needed • performance of communication interfaces • required controller memory • type of nonvolatile memory • EtherNet/IP and ControlNet messaging support	Controller specifications Control devices Communicate with other devices Connection information	page 23 page 25 page 26 page 28
	4 Select power supplies If power consumption exceeds the maximum for a single power supply, install additional power supplies.	Power supply specifications	page 33
	5 Select the mounting requirements Determine whether to panel mount or DIN rail mount the CompactLogix system.	Plan the mounting requirements	page 35
	6 Select software Based on the system design, determine the software products you need to configure and program your application.	Available software products Programming software Communication software Network configuration software Emulation software Visualization software and products	page 37 page 38 page 40 page 41 page 42 page 43

Step 1 - Select:

- *I/O modules*
- *wiring system (if you want to use a wiring system instead of the terminal block that comes with module)*
- *PanelConnect modules and cables if connecting input modules to sensors*
- *expansion cables if planning multiple banks of I/O modules*

Select Compact I/O Modules

The 1769 Compact I/O modules can be used as local I/O for a CompactLogix controller. Install the I/O modules on a panel with two mounting screws or on a DIN rail. The modules mechanically lock together by means of a tongue-and-grove design and have an integrated communication bus that is connected from module to module by a moveable bus connector.

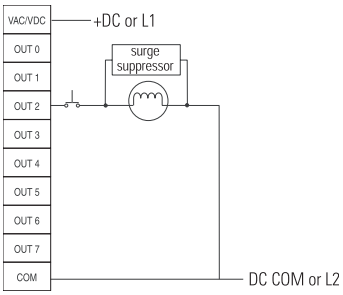
Each I/O module includes a built-in removable terminal block with finger-safe cover for connections to I/O sensors and actuators. The terminal block is behind a door at the front of the module. I/O wiring can be routed from beneath the module to the I/O terminals.

When planning I/O communications, consider:

- which Compact I/O modules to use
- where to place Compact I/O modules
- how Compact I/O modules operate

Digital I/O Modules

Type of Module	Description
input module	An input module responds to an input signal in the following manner: • Input filtering limits the effect of voltage transients caused by contact bounce and/or electrical noise. If not filtered, voltage transients could produce false data. All input modules use input filtering. • Optical isolation shields logic circuits from possible damage due to electrical transients. • Logic circuits process the signal. • An input LED turns on or off indicating the status of the corresponding input device.
output module	An output module controls the output signal in the following manner: • Logic circuits determine the output status. • An output LED indicates the status of the output signal. • Optical isolation separates module logic and bus circuits from field power. • The output driver turns the corresponding output on or off.



Most output modules have built-in surge suppression to reduce the effects of high-voltage transients. Use an additional suppression device if an output is being used to control inductive devices, such as relays, motor starters, solenoids, or motors. Additional suppression is especially important if your inductive device is in series with or parallel to hard contacts, such as push buttons or selector switches.

Add a suppression device directly across the coil of an inductive device to reduce the effects of voltage transients caused by interrupting the current to that device and to prolong the life of the switch contacts.

1769 Compact digital ac input modules

Cat. No.	Number of Inputs	Voltage Category/Type, Input	Voltage Range	Input Delay Time, ON to OFF	Current, On-State Input, Min.	Current, Off-State Input, Max.	Backplane Current (mA) at 5V	Power Supply Distance Rating
1769-IA8I	8 individually isolated	100 or 120V ac	79...132V ac @ 47...63Hz	20 ms	5 mA @ 79V ac	2.5 mA	90 mA	8 modules
1769-IA16	16	100 or 120V ac	79...132V ac @ 47-63Hz	20 ms	5 mA @ 79V ac	2.5 mA	115 mA	8 modules
1769-IM12	12	200 or 240V ac	159...265V ac @ 47-60Hz	20 ms	5 mA @ 159V ac	2.5 mA	100 mA	8 modules

1769 Compact digital ac output modules

Cat. No.	Number of Outputs	Voltage Category/Type, Output	Voltage Range	Leakage Current, Off-State Output, Max.	Current per Output, Max.	Current per Module, Max.	Backplane Current (mA) at 5V	Power Supply Distance Rating
1769-OA8	8	100…240V ac	85...265 ac @ 47-63Hz	2.0 mA at 132V ac 2.5 mA at 265V ac	0.25 A @ 60 °C (140 °F) 0.50 A @ 30 °C (86 °F)	2.0 A @ 60 °C (140 °F) 4.0 A @ 30 °C (86 °F)	145 mA	8 modules
1769-OA16	16	100...240V ac	85...265 ac @ 47-63Hz	2.0 mA at 132V ac 2.5 mA at 265V ac	0.25 A @ 60 °C (140 °F) 0.50 A @ 30 °C (86 °F)	4.0 A @ 60 °C (140 °F) 8.0 A @ 30 °C (86 °F)	225 mA	8 modules

1769 Compact digital dc input modules

Cat. No.	Number of Inputs	Voltage Category/Type, Input	Voltage Range	Input Delay Time, ON to OFF	Current, On-State Input, Min.	Current, Off-State Input, Max.	Backplane Current (mA) at 5V	Power Supply Distance Rating
1769-IQ6XOW4	6	24V dc, sinking or sourcing	10...30V dc @ 30 °C (86 °F) 10...26.4V dc @ 60 °C (140 °F)	8 ms	2 mA	1.5 mA	105 mA	8 modules
1769-IQ16	16	24V dc, sinking or sourcing	10...30V dc @ 30 °C (86 °F) 10...26.4V dc @ 60 °C (140 °F)	8 ms	2 mA	1.5 mA	115 mA	8 modules
1769-IQ16F	16 high-speed	24V dc, sinking or sourcing	10...30V dc @ 30 °C (86 °F) 10...26.4V dc @ 60 °C (140 °F)	1 ms	2 mA	1.5 mA	110 mA	8 modules
1769-IQ32	32	24V dc, sinking or sourcing	10...30V dc @ 30 °C (86 °F) 10...26.4V dc @ 60 °C (140 °F)	8 ms	2 mA	1.5 mA	170 mA	8 modules
1769-IQ32T	32 terminated	24V dc, sinking or sourcing	20.4...26.4V dc	8 ms♆	3 mA	1.7 mA	170 mA♆	8 modules

♆Preliminary

1769 Compact digital dc output modules

Cat. No.	Number of Outputs	Voltage Category/Type, Output	Voltage Range	Leakage Current, Off-State Output, Max.	Current per Output, Max.	Current per Module, Max.	Backplane Current (mA) at 5V	Power Supply Distance Rating
1769-OB8	8	24V dc, sourcing	20.4...26.4 dc	1.0 mA @ 26.4V ac	2.0 A @ 60 °C (140 °F)	8.0 A @ 60 °C (140 °F)	145 mA	8 modules
1769-OB16	16	24V dc, sourcing	20.4...26.4 dc	1.0 mA @ 26.4V ac	0.5 A @ 60 °C (140 °F) 1.0 A @ 30 °C (86 °F)	4.0 A @ 60 °C (140 °F) 8.0 A @ 30 °C (86 °F)	200 mA	8 modules
1769-OB16P	16 protected	24V dc, sourcing	20.4...26.4 dc	1.0 mA @ 26.4V ac	0.5 A @ 60 °C (140 °F) 1.0 A @ 30 °C (86 °F)	4.0 A @ 60 °C (140 °F) 8.0 A @ 30 °C (86 °F)	160 mA❄	8 modules
1769-OB32	32	24V dc, sourcing	20.4...26.4 dc	1.0 mA @ 26.4V ac	0.5 A @ 60 °C (140 °F) 1.0 A @ 30 °C (86 °F)	8.0 A @ 60 °C (140 °F) 16.0 A @ 30 °C (86 °F)	300 mA	8 modules
1769-OV16	16	24V dc, sinking	20.4...26.4 dc	1.0 mA @ 26.4V ac	0.5 A @ 60 °C (140 °F) 1.0 A @ 30 °C (86 °F)	4.0 A @ 60 °C (140 °F) 8.0 A @ 30 °C (86 °F)	200 mA	8 modules
1769-OV32T	32 terminated	24V dc, sinking	10.2...26.4 dc	1.0 mA @ 26.4V ac	0.5 A @ 60 °C (140 °F) 1.0 A @ 30 °C (86 °F)	4.0 A @ 60 °C (140 °F) 8.0 A @ 30 °C (86 °F)	200 mA✞	8 modules

✞Preliminary

1769 Compact digital contact output modules

Cat. No.	Number of Outputs	Voltage Category/Type, Output	Voltage Range	Leakage Current, Off-State Output, Max.	Current per Output, Max.	Current per Module, Max.	Backplane Current (mA) at 5V	Backplane Current (mA) at 24V	Power Supply Distance Rating
1769-IQ6XOW4	4	24V dc	5...265V ac 5...125V dc	0 mA	2.5 A	8.0 A	105 mA	50 mA	8 modules
1769-OW8	8	24V dc	5...265V ac 5...125V dc	0 mA	0.5 A @ 60 °C (140 °F) 1.0 A @ 30 °C (86 °F)	16 A	125 mA	100 mA	8 modules
1769-OW8I	8 individually isolated	24V dc	5...265V ac 5...125V dc	0 mA	0.5 A @ 60 °C (140 °F) 1.0 A @ 30 °C (86 °F)	16 A	125 mA	100 mA	8 modules
1769-OW16	16	24V dc	5...265V ac 5...125V dc	0 mA	2.5 A	20 A	205 mA	180 mA	8 modules

These ratings apply to the digital contact output modules.

Volts, Max.	Continuous Amps per Point	Amperes		Voltamperes		IEC 947	NEMA ICS 2-125
		Make	Break	Make	Break		
240V ac	2.5A	7.5A	0.75A	1800VA	180VA	AC15✞	C300
120V ac		15A	1.5A				
125V dc	1.0A	0.22A		28VA		DC13✞	R150
24V dc	2.0A	1.2A		28VA		—	—

✞Does not apply to the 1769-OW16 module.

Analog I/O Modules

Choose analog, thermocouple, or RTD modules.

1769 Compact analog modules

Cat. No.	Number of Inputs	Number of Outputs	Resolution, Bits	Signal Range	Sensors Supported	Backplane Current (mA) at 5V	Backplane Current (mA) at 24V	Power Supply Distance Rating
1769-IF4	4	—	14 bits (unipolar)	0…20 mA 4…20 mA 0…10V dc ±10V dc 0…5V dc 1…5V dc	—	105 mA	60 mA❄	8 modules‡
1769-IF4I	4 individually isolated	—	16 bits (unipolar)	±10.5V dc -0.5…10.5V dc -0.5...5.25V dc 0.5…5.25V dc	—	145 mA	95 mA	8 modules
1769-IF8	8	—	16 bits (unipolar)	0…20 mA 4…20 mA 0…10V dc ±10V dc 0…5V dc 1…5V dc	—	120 mA	70 mA	8 modules
1769-OF2	—	2	14 bits	—	—	120 mA	120 mA❄	8 modules
1769-OF4CI	—	4 current, individually isolated	16 bits (unipolar)	4…20 mA 0…20V mA	—	145 mA	140 mA	8 modules
1769-OF4VI	—	4 voltage, individually isolated	16 bits (unipolar)	-10…10V dc 0…5V dc 0...10V dc 1…5V dc	—	145 mA	75 mA	8 modules
1769-OF8C	—	8 current	16 bits (unipolar)	0…20 mA 4…20 mA 0…10V dc ±10V dc 0…5V dc 1…5V dc	—	145 mA	160 mA	8 modules
1769-OF8V	—	8 voltage	16 bits (unipolar)	0…20 mA 4…20 mA	—	145 mA	125 mA	8 modules
1769-IF4XOF2	4	2 individually isolated	8 bits plus sign§ individually isolated	0…10V dc ±10V dc 0…5V dc 1…5V dc	—	120 mA	160 mA	8 modules
1769-IR6	6	—	Input filter and configuration dependent	—	100, 200, 500, 1000 Ω Platinum, alpha=385 100, 200, 500, 1000 Ω Platinum, alpha=3916 120 Ω Nickel, alpha=672 120 Ω Nickel, alpha=618 10 Ω Copper 604 Ω Nickel-Iron 518 0…150 Ω 0…500 Ω 0…1000 Ω 0…3000 Ω	100 mA	45 mA	8 modules
1769-IT6	6, plus 2 cold junction sensors	—	—	—	Thermocouple types: J, K, T, E, R, S, B, N, C ±50mV ±100mV	100 mA	40 mA	8 modules

1769-HSC High-Speed Counter Module

Use the 1769-HSC when you need:

- a counter module that is capable of reacting to high-speed input signals
- to generate rate and time-between-pulses (pulse interval) data
- as many as 2 channels of quadrature or 4 channels of pulse/count inputs

Cat. No.	Number of Inputs	Number of Outputs	Backplane Current (mA) at 5V	External Power	Power Supply Distance Rating
1769-HSC	2	4	425 mA	19.2...31.2V dc 100 mA @ 24V dc	4 modules

1769-ARM Address Reserve Module

Use a 1769-ARM address reserve module to reserve a module slot. After creating an I/O configuration and user program, you can remove and replace any I/O module in the system with a 1769-ARM module.

Cat. No.	Number of Inputs	Number of Outputs	Backplane Current (mA) at 5V	Power Supply Distance Rating
1769-ARM	—	—	60 mA	8 modules

Compact I/O to PowerFlex Drives

The 1769-SMx modules provide direct 1769 platform connection to PowerFlex drives.

Cat. No.	Description	Communication Rate	Backplane Current (mA) at 5V	Backplane Current (mA) at 24V	Power Supply Distance Rating
1769-SM1	Compact I/O to DPI/SCANport Module connects to PowerFlex 7-Class drives, other DPI-based Host devices, and SCANport-based Host devices such as 1305 and 1336 PLUS II drives	DPI: 1925 Kpbs or 250 Kpbs SCANport: 125 Kbps	280 mA	60 mA per channel supplied by the DPI/SCANport host	6 modules
1769-SM2	Compact I/O to DSI/Modbus Module connects to PowerFlex 4-Class drives and to other Modbus RTU Slave devices, such as PowerFlex 7-Class drives with 20-COMM-H RS485 HVAC adapters	DSI: 19.2 Kbps Modbus RTU: 300...38.4 Kbps	350 mA	0 mA	4 modules

Communication Modules

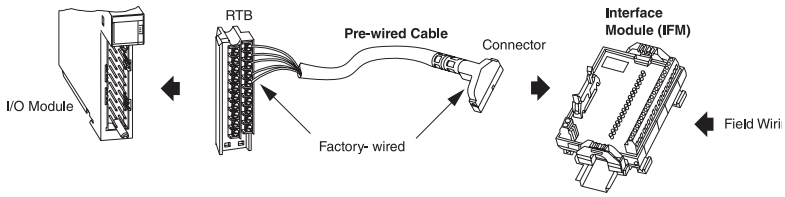
You can select from these communication modules:

Cat. No.	Description	Communication Rate	Power	Power Consumption (W) at 24V	Backplane Current (mA) at 5V	Power Supply Distance Rating
1769-SDN scanner	CompactLogix DeviceNet Scanner Module	125k Kbps 250k Kbps 500k Kbps	90 mA @ 11V dc 110 mA @ 25V dc (N.E.C. Class 2)	2.2	440 mA	4 modules
1769-ADN adapter	CompactLogix DeviceNet Adapter, Series B		90 mA @ 24V dc (+4%) (N.E.C. Class 2)	2.5	450 mA	5 modules
1769-ASCII adapter	CompactLogix ASCII Serial Gateway Module	—	—	6.0	420 mA	4 modules

1492 Wiring Systems

As an alternative to buying RTBs and connecting the wires yourself, you can buy a wiring system of:

- interface modules (IFMs) that provide the output terminal blocks for digital I/O modules. Use the pre-wired cables that match the I/O module to the IFM.
- analog interface modules (AIFMs) that provide the output terminal blocks for analog I/O modules. Use the pre-wired cables that match the I/O module to the AIFM.
- I/O-module-ready cables. One end of the cable assembly is an RTB that plugs into the front of the I/O module. The other end has individually color-coded conductors that connect to a standard terminal block.



The IFMs have these options for terminal types:

- feed-through
- feed-through expander
- LED indicating
- fusible
- fusible expander
- relay master (LED indicating)
- relay expander

The AIFMs have these options for terminal types:

- feed-through
- thermocouple
- fusible

For detailed selection criteria, see the Industrial Controls product catalog at www.ab.com

1492 PanelConnect Modules for Connecting Sensors

A PanelConnect module and its sensor connection systems let you connect sensors directly to I/O modules using convenient pre-built cables and connectors.

The PanelConnect module mounts on the enclosure and creates the correct seal for the entry of the sensor connections. You do not need to seal the opening where the sensor cables enter the enclosure, create custom connectors, or wire to those custom connectors.

Select the appropriate 889N series patchcords to connect PannelConnect modules to sensor distribution boxes available from:

- Allen-Bradley
- Brad Harrison (Daniel Woodhead)
- Crouse-Hinds
- Lumberg
- Turck

For detailed selection criteria, see the Industrial Controls product catalog at www.ab.com

Place Compact I/O Modules in a CompactLogix System

You can DIN-rail or panel-mount the controller and I/O modules. The number of local I/O modules supported depends on the controller.

This controller:	Supports:	That can be in:
1769-L35CR 1769-L35E	30 local modules	3 separate banks
1769-L32C 1769-L32E 1769-L31	16 local modules	3 separate banks

If you separate the modules into multiple banks:

- the controller must be in the leftmost position of the first bank
- each bank needs its own power supply
- use expansion cables to connect the banks
- the last I/O bank requires an end cap

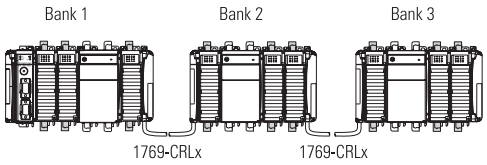
Select expansion cables

How you orient I/O banks determines which expansion cables you need to connect the I/O banks:

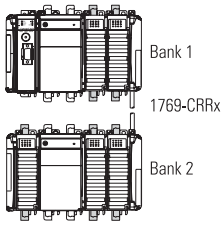
If you add a:	And connect the chassis:	Use this cable:[1]
second bank	right to left	1769-CRLx
	right to right	1769-CRRx
third bank	right to left	1769-CRLx
	right to right	1769CRRx
	left to left	1769-CLLx

[1] Where x = 1 for 1 ft. (305 mm) or 3 for 3.28 ft. (1 m)

Horizontal Orientation



Vertical Orientation



Add end caps

The controller is the leftmost module in the CompactLogix system. The controller has built-in termination, so the leftmost end of the system is terminated.

The final I/O bank in the CompactLogix system needs an end cap on the end without the expansion cable.

For a:	Order:
right end cap	1769-ECR
left end cap	1769-ECL

Select local or remote (distributed) I/O

In addition to local I/O, the CompactLogix controller can control remote (distributed) I/O via:

- EtherNet/IP using a 1769-L32E or 1769-L35E controller
- ControlNet using a 1769-L32C or 1769-L35CR controller
- DeviceNet using a 1769-SDN scanner module

While local I/O can be lower cost and easier to configure, configuring remote I/O offers:

- more versatility in laying out your system
- more communication options, such as DeviceNet, ControlNet, and EtherNet/IP
- ability to configure the listen only communication format for remote I/O modules

Validate I/O layout for 1769-L3xx controllers

The 1769-L3xx controller supports as many as 30 local modules which can be any combination of digital, analog, and specialty modules.

- Each module in a CompactLogix system uses a set amount of backplane memory, in addition to the data that the module stores or transfers. As you add modules, the minimum backplane RPI increases.
- To validate your system, the total 5V dc current and 24V dc current consumed must be considered. The I/O modules must be distributed such that the current consumed from the left or right side of the power supply never exceeds 2.0A at 5V dc and 1.0A at 24V dc.

As you install modules, the minimum backplane RPI increases. The RPI (request packet interval) defines the frequency at which the controller sends and receives all I/O data on the backplane. There is one RPI for the entire 1769 backplane. Consider these guidelines when installing modules:

Type of Module:	Considerations:
digital and analog (any mix)	• 1-4 modules can be scanned in 1.0 ms • 5-16 modules can be scanned in 1.5 ms • 17-30 modules can be scanned in 2.0 ms • some input modules have a fixed 8.0 ms filter, so selecting a faster RPI has no affect
specialty	• "full-sized" 1769-SDN modules add 1.5 ms per module • 1769-HSC modules add 0.5 ms per module

You can always select an RPI that is slower than listed above. These considerations show how fast modules can be scanned - not how fast an application can use the data. The RPI is asynchronous to the program scan. Other factors, such as program execution duration, affect I/O throughput.

How Compact I/O Modules Operate

The CompactLogix system follows a producer/consumer model. Input modules produce data for the system. Controllers, output modules, and specialty modules produce and consume data. The producer/consumer model multicasts data. This means that multiple nodes can consume the same data at the same time from a single device.

The controller continually scans the control logic. One scan is the time it takes the controller to execute the logic once. Input data transfers to the controller and output data transfers to output modules asynchronous to the logic scan.

All I/O modules in a CompactLogix system are scanned asynchronous to the program scan at a configurable RPI rate. You configure one RPI rate for all the local I/O in all the banks: 1 ms...750 ms for 1769-L3xx controllers

Important: CompactLogix does not support Removal and Insertion Under power (RIUP). While the CompactLogix system is under power, any break in the connection between the power supply and the processor (i.e. removing the power supply, processor, or an I/O module) will clear processor memory (including the user program).

Select Controller Ownership

In a Logix system, modules multicast data. This means that multiple devices can receive the same data at the same time from a single device. When you choose a communication format for an I/O module, you have to choose whether to establish an owner or listen-only relationship with the module.

Relationship	Description
owner controller	The controller that creates the primary configuration and communication connection to a module. The owner controller writes configuration data and can establish a connection to the module.
listen-only connection	An owner provides the configuration data for the I/O module. A controller using a listen-only connection only monitors the module. It does not write configuration data and can only maintain a connection to the I/O module while the owner controller is actively controlling the I/O module.

Because of the distributed nature of a CompactLogix system, the CompactLogix controller must own its local I/O modules. No other Logix controller can listen to or own the local Compact I/O. The CompactLogix controller must produce its local I/O data for any other controller to consume. The listen-only format only works for remote I/O.

Step 2 - Select:

- *networks*
- *communication interfaces*
- *associated cable(s) and network equipment*

Select Network Communications

You use separate interface modules to connect to different networks.

- The 1769-L32E and 1769-L35E controllers each have a built-in EtherNet/IP port and a built-in serial port.
- The 1769-L32C and 1769-L35CR controllers each have a built-in ControlNet port and a built-in serial port.
- The 1769-L31 controller has two built-in RS-232 ports.

NetLinx Open Network Architecture

NetLinx Open Network Architecture is the Rockwell Automation strategy of using open networking technology for seamless, top-floor to shop-floor integration. The NetLinx-based networks – DeviceNet, ControlNet, and EtherNet/IP – all use the Common Industrial Protocol, so they speak a common language and share a universal set of communication services. NetLinx architecture, part of the Integrated Architecture, seamlessly integrates all the components in an automation system from a few devices on one network to multiple devices on multiple networks including access to the Internet – helping you to improve flexibility, reduce installation costs, and increase productivity.

- EtherNet/IP is an open industrial networking standard that supports implicit and explicit messaging and uses commercial, off-the-shelf Ethernet equipment and physical media.
- ControlNet allows intelligent, high-speed control devices to share the information required for supervisory control, work-cell coordination, operator interface, remote device configuration, programming, and troubleshooting.
- DeviceNet offers low-cost, high-speed access to plant-floor data from a broad range of plant-floor devices and a significant reduction in wiring.

Select a network

You can configure your system for information exchange between a range of devices and computing platforms and operating systems. Select a CompactLogix controller with integrated communications or the appropriate communication device for the networks that meet your needs:

If your application requires:	Use this network:	Select:
• plant management • configuration, data collection, and control on a single, high-speed network • time-critical applications with no established schedule • data sent regularly • Internet/Intranet connection	EtherNet/IP network	1769-L32E, -L35E controller 1769-L31 controller with 1761-NET-ENI
• high-speed transfer of time-critical data between controllers and I/O devices • deterministic and repeatable data delivery • media redundancy • intrinsic safety • redundant controller systems	ControlNet network	1769-L32C, -L35CR controller
• connections of low-level devices directly to plant floor controllers, without interfacing them through I/O modules • data sent as needed • more diagnostics for improved data collection and fault detection • less wiring and reduced start-up time than a traditional, hard-wired system	DeviceNet network	1769-SDN scanner 1761-NET-DNI interface 1769-ADN adapter
• modems • supervisory control and data acquisition (SCADA)	serial network	built-in serial port on all CompactLogix controllers
• connections to existing DH-485 networks	DH-485 network	built-in serial port with a 1761-NET-AIC

EtherNet/IP Network

Ethernet Industrial Protocol (EtherNet/IP) is an open industrial networking standard that supports both real-time I/O messaging and message exchange. It emerged due to the high demand for using the Ethernet network for control applications. EtherNet/IP uses off-the-shelf Ethernet communication chips and physical media.

EtherNet/IP product capability

	Recipient								
Originator	**EtherNet/IP PLC-5 or SLC 5/05 processor**	**PLC-5 processor via 1785-ENET**	**Logix5000 controller✞**	**1756-ENBT module✞**	**1794-AENT FLEX I/O adapter**	**1734-AENT POINT I/O adapter**	**PanelView EtherNet/IP terminal**	**RSLinx software**	**CompactLogix controller with 1761-NET-ENI interface**
EtherNet/IP PLC-5 or SLC 5/05 processor	information	information	information	na	not supported	not supported	information	information	information
PLC-5 processor via 1785-ENET	information	information	information	na	not supported	not supported	information	information	information
Logix controller✞	information	information	information I/O data interlocking	I/O data	I/O data	I/O data	information I/O data	information	information
PanelView EtherNet/IP terminal	information	information	information I/O data	na	na	na	na	na	information
RSLinx software	information	information	information	na	not supported	not supported	na	information	information
CompactLogix controller with 1761-NET-ENI interface❄	information	information	information	na	not supported	not supported	information	information	information

✞ For EtherNet/IP control:
- a ControlLogix controller requires a 1756-ENBT or 1756-ENET series B module
- a FlexLogix controller requires a 1788-ENBT card
- a CompactLogix controller must be a 1769-L32E or 1769-L35E controller
- the PC for a SoftLogix5800 controller requires appropriate hardware for Ethernet communications

❄To be an originator, the 1761-NET-ENI interface must connect to the other device through that device's RS-232 port.

Select an EtherNet/IP interface

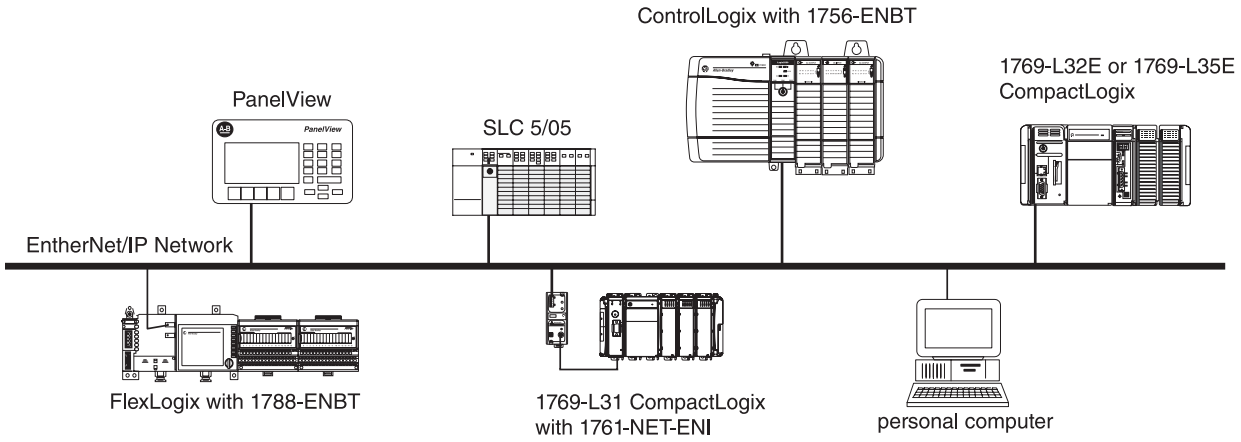
Select the appropriate controller and EtherNet/IP interface depending on the application and how the controller interacts with the devices:

If your application:	Select this controller and interface:	Description:
• controls I/O over EtherNet/IP • produces and consumes data over EtherNet/IP • accesses both EtherNet/IP and serial devices • requires high performance over EtherNet/IP	1769-L32E or 1769-L35E CompactLogix controller with integrated EtherNet/IP port	The 1769-L32E and 1769-L35E CompactLogix controller has one built-in EtherNet/IP port and one built-in RS-232 port. The controller can control local I/O in addition to I/O remotely connected via EtherNet/IP. The controller supports as many as 32 remote EtherNet/IP connections.
• sends and receives messages over EtherNet/IP • transfers small amounts of data over EtherNet/IP	1769-L31 controller with 1761-NET-ENI interface, series B	The 1761-NET-ENI series B interface module routes a DF1 message received from the attached controller to a compatible destination TCP/IP device. This is accomplished by using DF1 node addresses 0 through 49. The 1761-NET-ENI node addresses 100 through 149 store TCP/IP destination addresses. When the 1761-NET-ENI receives a write message to nodes 100 to 149, it stores the TCP/IP destination address in the corresponding map register.

Cat. No.	Communication Rate	Connections Supported, Max.	Connector	Power Dissipation	Backplane Current (mA) at 5V	Backplane Current (mA) at 24V	Power Supply Distance Rating
1769-L32E	10/100 Mbps	64 TCP/IP connections 32 Logix connections (I/O and information) 5000 messages/second	RJ-45	4.74 W	660 mA	90 mA	4 modules
1769-L35E	10/100 Mbps			4.74 W	660 mA	90 mA	4 modules
1761-NET-ENI	10 Mbps	6 TCP/IP connections		—	0 mA	50 mA	—

Certifications: UL, CSA (Class I, Division 2, Group A, B, C, D), CE

☞The 1761-NET-ENI is an Ethernet to serial linking device. While 10 Mbps is the fastest communication rate supported by a 1761-NET-ENI device, the actual network performance depends on the maximum serial port connection speed.



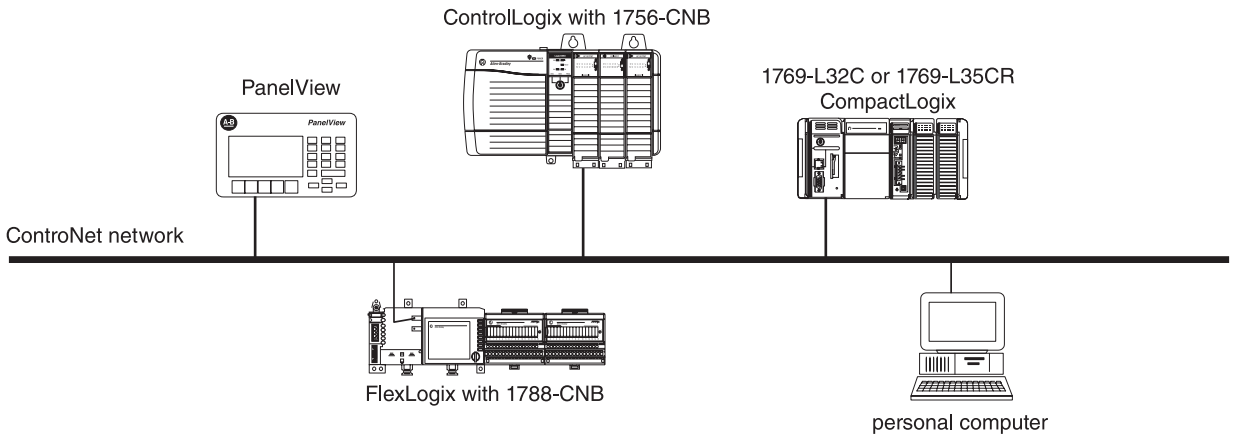
ControlNet Network

The ControlNet network is an open, state-of-the-art control network that meets the demands of real-time, high-throughput applications. The ControlNet network uses the proven Common Industrial Protocol (CIP) to combine the functionality of an I/O network and a peer-to-peer network providing high-speed performance for both functions.

The ControlNet network gives you deterministic, repeatable transfers of all mission-critical control data in addition to supporting transfers of non-time-critical data. I/O updates and controller-to-controller interlocking always take precedence over program uploads and downloads and messaging.

Cat. No.	Communication Rate	Connections Supported, Max.	Connector	Power Dissipation	Backplane Current (mA) at 5V	Backplane Current (mA) at 24V	Power Supply Distance Rating
1769-L32C (single media)	5 Mbps	32 connections 1490 messages/second	RG-6 coaxial cable 1786-RG6 (quad shield cable) 1786-RG6F (quad shield high flex coax cable) 1786-XT termination resistor Choose taps: • 1786-TPR (T-tap right angle) • 1786-TPS (T-tap straight) • 1786-TPYR (Y-tap right angle) • 1786-TPYS (T-tap straight) • 1786-TCT2BD1 (IP67 tap)	4.36 W	680 mA	40 mA	4 modules
1769-L35CR (redundant media)				4.36 W	680 mA	40 mA	4 modules

Certifications: UL, CSA (Class I, Division 2, Group A, B, C, D), CE



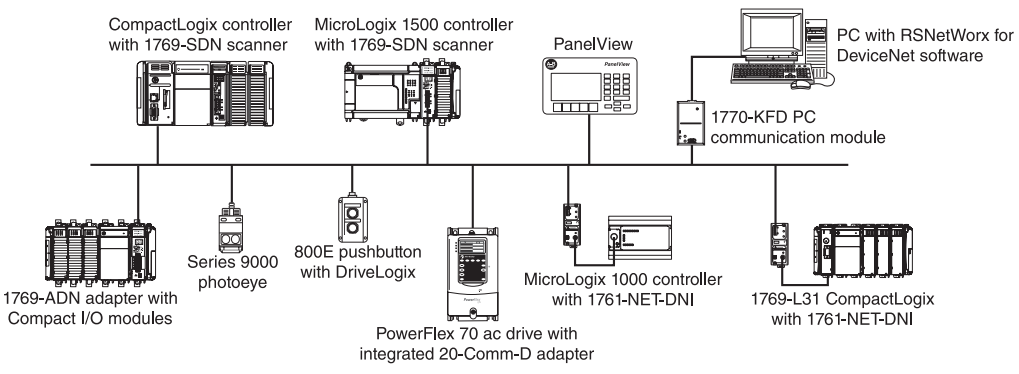
DeviceNet Network

The DeviceNet network is an open low-level network that provides connections between simple industrial devices (such as sensors and actuators) and higher-level devices (such as PLC controllers and computers). The DeviceNet network uses the proven Common Industrial Protocol (CIP) to provide the control, configure, and data collection capabilities for industrial devices. The DeviceNet network is a flexible network that works with devices from multiple vendors.

If your application does this:	Select this interface:	Description:
• communicates with other DeviceNet devices (I/O and messages) • requires explicit messaging • uses the controller as a master or slave • uses the controller serial port for other communications • requires higher performance than available from the 1769-NET-DNI	1769-SDN DeviceNet scanner module	The scanner acts as an interface between DeviceNet devices and the CompactLogix controller. The scanner lets the controller: • read inputs from slave devices • write outputs to slave devices • send and receive messages
• communicates with other DeviceNet devices (messaging only) • uses the controller only as a slave on DeviceNet • does not use the controller serial port for other communications • trades lower cost for lower performance than the 1769-SDN	1761-NET-DNI interface	The interface module links the CompactLogix controller to other devices on a DeviceNet network to: • download configuration data to a device • monitor operational status of a device • communicate with peer devices (messaging) • upload/download programs
• accesses remote Compact I/O over a DeviceNet network • sends remote I/O data for as many as 30 modules back to scanner or controller	1769-ADN DeviceNet adapter module	The adapter: • interfaces with as many as 30 Compact I/O modules • communicates to other network system components (typically a controller or scanner and/or programming terminals)

Cat. No.	Communication Rate	Cable	DeviceNet Power Requirements, Max.	Power Consumption (W) at 24V	Backplane Current (mA) at 5V	Backplane Current (mA) at 24V	Power Supply Distance Rating
1769-SDN	125k Kbps 250k Kbps 500k Kbps	Allen-Bradley part number 1485C-P1-Cxxx	90 mA @ 11V dc 110 mA @ 25V dc (N.E.C. Class 2)	2.2	440 mA	— mA	4 modules
1761-NET-DNI♆			11…25V dc	—	0 mA	200 mA	— modules
1769-ADN❄			90 mA @ 24V dc (+4%) (N.E.C. Class 2)	2.5	450 mA	— mA	5 modules

Certifications: UL, CSA (Class I, Division 2, Group A, B, C, D), CE, FM, C-Tick
♆The 1761-NET-DNI is a DeviceNet to serial linking device. The actual network performance depends on the maximum serial port connection speed.
❄The series A 1769-ADN adapter does not support the 1769-OA16, 1769-OW16, 1769-IF4XOF2, or 1769-HSC modules.



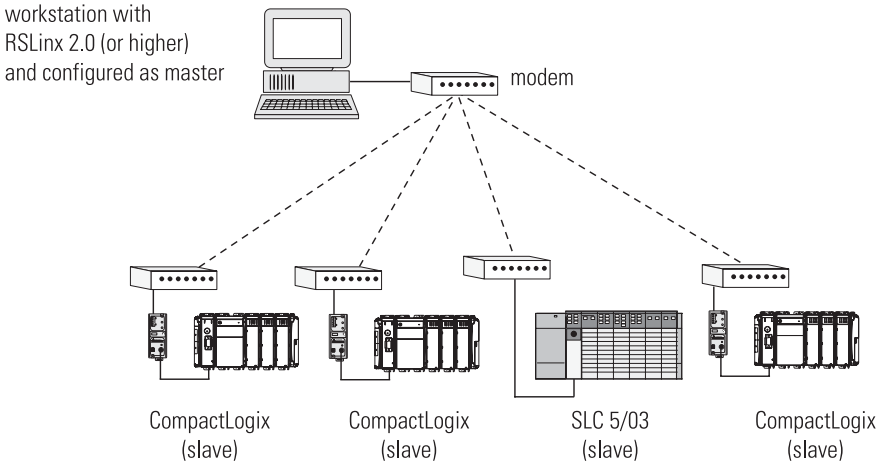
Serial Network

The serial port is compatible with RS-232 serial communication. The serial port supports the DF1 protocol to communicate with other devices on the serial link. You can select:

Use this DF1 mode:	For:
point to point	communication between a controller and other DF1-compatible devices using DF1 full-duplex protocol
DF1 master	control of polling and message transmission between the master and each slave using DF1 half-duplex polled protocol
DF1 slave	using the controller as a slave station in a master/slave serial network using DF1 half-duplex protocol
user mode (ASCII)	communication between a controller and an ASCII device, such as a bar code reader

The CompactLogix controller you choose determines the number of serial ports that are available:

If you need:	Identified as:	With this protocol:	Select this controller:
one serial port	channel 0 (fully isolated)	DF1, DH-485, ASCII	1769-L35CR, -L35E 1769-L32C, -L32E
two serial ports	channel 0 (fully isolated) channel 1 (non-isolated)	channel 0: DF1, DH-485, ASCII channel 1: DF1, DH-485	1769-L31



If you connect the controller to a non-isolated port (channel 1) on the controller to a programming workstation, modem, or ASCII device, install an isolator between the controller and the end device. One possible isolator is the 1761-NET-AIC interface converter.

Modbus support

To use Logix5000 controllers on Modbus, you connect through the serial port and execute a specific ladder logic routine. The controller project is available with RSLogix 5000 Enterprise programming software. For more information, see *Using Logix5000 Controllers as Masters or Slaves on Modbus Application Solution*, publication CIG-AP129.

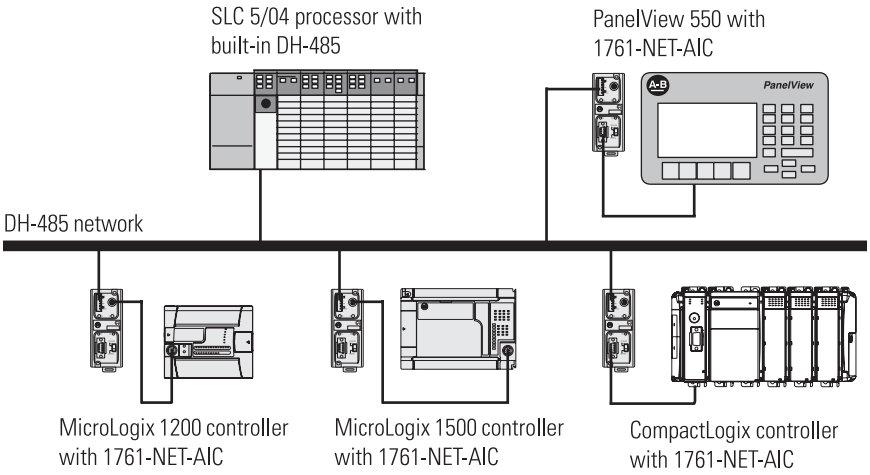
DH-485 Network

On the DH-485 network, the controller can send and receive messages to and from other controllers on the network. The DH-485 connection does support remote programming and monitoring via RSLogix 5000 software. However, excessive traffic over a DH-485 connection can adversely affect overall performance and can lead to timeouts and loss in RSLogix 5000 configuration performance.

Important: Only use Logix5000 controllers on DH-485 networks when you want to add controllers to an existing DH-485 network. For new applications with Logix5000 controllers, networks in the NetLinx architecture are the recommended networks.

You need a 1761-NET-AIC+ converter for each controller you want to put on the DH-485 network. You can have two controllers per one 1761-NET-AIC+ converter, but you need a different cable for each controller. Connect one controller to port 1 (9-pin connector) and one controller to port 2 (mini-DIN connector).

If you connect to this port:	Use this cable:
port 1 DB-9 RS-232, DTE connection	1747-CP3 or 1761-CBL-AC00
port 2 mini-DIN 8 RS-232 connection	1761-CBL-AP00 or 1761-CBL-PM02



Step 3 - Select:

- *a controller with the correct network port*
- *a controller with sufficient memory*
- *replacement batteries*
- *a 1784-CF54 CompactFlash card*

Select Controllers

CompactLogix controllers can monitor and control I/O across the 1769 CompactBus, as well as over remote I/O links. CompactLogix controllers can communicate with computers or other processors across RS-232-C (DF1/DH-485 protocol), DeviceNet, ControlNet, and EtherNet/IP networks. To provide communication for a CompactLogix controller, install the appropriate interface module or select a controller with integrated communications.

The multi-tasking operating system supports configurable tasks that can be prioritized. One task can be continuous. The others must be periodic or event tasks. Each task can have as many as 32 programs, each with its own local data and logic, allowing virtual machines to operate independently within the same controller.

Specification	Description
Power Supply Distance Rating	4 modules
Power Supply	1769-PA2 1769-PB2 1769-PA4 1769-PB4
Battery	1769-BA
Supported Programming Languages	relay ladder function block diagram structured text sequential function chart
Programming Cable	1761-CBLPM02 to 1761-NET-AIC isolator 1761-CBLPA00 to 1761-NET-AIC isolator 1756-CP3 directly to controller 1747-CP3 directly to controller standard RJ-45 Ethernet cable (1769-L35E)

Certifications: UL, CSA (Class I, Division 2, Group A, B, C, D), CE, C-Tick

CompactLogix Controllers

Cat. No.	Available User Memory (Kbytes)✞	Nonvolatile Memory❄	Number of Concurrent Tasks	Communication Ports	Backplane Current (mA) at 5V	Backplane Current (mA) at 24V	Power Dissipation	I/O Module Capacity	I/O Banks Supported, Max.	Power Supply Distance Rating
1769-L35E	1536 Kbytes	64 Mbytes CompactFlash	8	1 RS-232 port 1 EtherNet/IP port	660 mA	90 mA	4.74 W	30	3	4 modules
1769-L35CR	1536 Kbytes	64 Mbytes CompactFlash	8	1 RS-232 port ControlNet channels A and B	680 mA	40 mA	4.36 W	30	3	4 modules
1769-L32E	768 Kbytes	64 Mbytes CompactFlash	6	1 RS-232 port 1 EtherNet/IP port	660 mA	90 mA	4.74 W	16	3	4 modules
1769-L32C	768 Kbytes	64 Mbytes CompactFlash	6	1 RS-232 port ControlNet channel A	680 mA	40 mA	4.36 W	16	3	4 modules
1769-L31	512 Kbytes	64 Mbytes CompactFlash	4	CH0 - RS-232 DF1, DH-485, ASCII fully isolated CH1 - RS-232 DF1, DH-485, ASCII non-isolated	330 mA	40 mA	2.61 W	16	3	4 modules

✞Available user memory is the amount of memory available to the user after RSLogix 5000 Enterprise Series software is connected and a null program is loaded.
❄Requires a 1784-CF64 Industrial CompactFlash card.

Estimate controller memory use

The following equations provide an estimate of the memory needed for a controller.

Controller tasks	_____ * 4000	=	_____ bytes (minimum 1 task)
Digital I/O points	_____ * 400	=	_____ bytes
Analog I/O points	_____ * 2600	=	_____ bytes
Motion axes	_____ * 8000	=	_____ bytes

Non-volatile memory

The 1784-CF64 card offers nonvolatile memory (flash) to permanently store a user program and tag data on a controller. You can:

- manually trigger the controller to save to or load from nonvolatile memory
- configure the controller to load from nonvolatile memory on power up

Controller battery

The CompactLogix controller comes with one 1769-BA lithium battery.

Control Devices

The CompactLogix controller can control these devices:

I/O Modules	1769-L32E, -L35E EtherNet/IP✞	1769-L32C, -L35CR ControlNet	DeviceNet❄
1756 ControlLogix	yes	yes	yes
1794 FLEX	yes	yes	yes
1797 FLEX Ex‡	yes	yes	no
1734 POINT	yes	yes	yes
1734D POINTBlock	yes	yes	yes
1769 Compact I/O	yes	yes	yes
1790 Compact Block LDX	no	no	yes
1791 Standard Block	no	no	no
1791D CompactBlock	no	no	yes
1792 ArmorBlock	no	no	yes
1792D ArmorBlock MaXum	no	no	yes
1798 FLEX Armor	no	no	yes
1799 Embedded	no	no	yes
1746	no	no	no
1771	no	no	no

✞A non-EtherNet/IP CompactLogix controller requires a 1761-NET-ENI interface to connect to an EtherNet/IP network. This interface is only a messaging bridge.
❄To control I/O, use a 1769-SDN scanner to connect the controller to the DeviceNet network.
‡Insert a 1797-BIC and 1797-CEC module pair to isolate the FLEX Ex I/O modules from the non-intrinsically safe portion of the system.
§Use a 1771-ACN15, -ACNR15 adapter module. Version 10 and later of RSLogix 5000 Enterprise Series software supports 1771 digital, analog, and specialty I/O modules. Previous versions of the software support only 1771 digital I/O modules.

Display Devices	EtherNet/IP✞	ControlNet	DeviceNet❄	RS-232 (DF1)	DH-485
2711P PanelView Plus terminal	yes	yes	yes	yes	yes
6182H VersaView CE computer	yes	yes	yes	yes	yes
2711 PanelView terminal	yes	yes	yes	yes‡	yes‡
2711 e PanelView terminal	no	no	no	no	no
2705 RediSTATION/RediPANEL operator module	no	no	yes	no	no
2706 InView message display	yes	yes	yes	yes	yes
2706 DL40 Dataliner message display	no	no	no	yes	no
2706 DL, DL50 DataLiner message display	no	no	no	yes	no
2707 DTAM Plus operator interface	no	no	yes	yes‡	yes‡

✞A non-EtherNet/IP CompactLogix controller requires a 1761-NET-ENI interface to connect to an EtherNet/IP network. This interface is only a messaging bridge.
❄For DeviceNet access, use either a 1769-SDN scanner (control I/O and send/receive messages) or a 1761-NET-DNI interface (messaging bridge).
‡Use PLC/SLC mapping.

Communicate with Other Controllers and Communication Devices

The CompactLogix system takes advantage of several networks to allow communications with many different controllers and devices. The following table lists which products the CompactLogix controller can communicate with over which networks.

Controller	EtherNet/IP✞	ControlNet	DeviceNet❄	RS-232 (DF1)	DH-485
1756 ControlLogix	yes	yes	yes	yes	yes
1769 CompactLogix	yes	yes	yes	yes	yes
1789 SoftLogix5800	yes	yes	yes	yes	no
1794 FlexLogix	yes	yes	yes	yes	yes
5720 PowerFlex 700S DriveLogix	yes	yes	yes	yes	no
1785 PLC-5	yes‡§	yes‡§	yes♣	yes	na
1747 SLC	yes↗	yes↗	yes♣	yes	yes
1761 MicroLogix	yes	no	yes♣	yes	yes
1762 MicroLogix	yes	no	yes♣	yes	yes
1769 MicroLogix	yes	no	yes♣	yes	yes
1772 PLC-2	na	na	na	yes⌘	na
1775 PLC-3	na	na	na	yes✦	na
5250 PLC-5/250	no	no	na	yes	na

✞A non-EtherNet/IP controller requires a 1761-NET-ENI interface to connect to an EtherNet/IP network. This interface is only a messaging bridge.
❄For DeviceNet access, use either a 1769-SDN scanner (control I/O and send/receive messages) or a 1761-NET-DNI interface (messaging bridge).
‡The Ethernet PLC-5 processor must be one of these:
series C, revision N.1 or later
series D, revision E.1 or later
series E, revision D.1 or later
§The 1785-ENET Ethernet communication interface module must be series A, revision D or later.
♣The PLC-5, SLC, and MicroLogix processors appear as I/O points to the Logix controller. Requires 1761-NET-DNI DeviceNet interface.
↗Use a 1747-L55x controller with OS501 or greater.
⌘The PLC-2 controller requires a 1771-KG module for serial (DF1) communications.
✦The PLC-3 controller requires a 1775-KA module for serial (DF1) communications.

Communication Device	EtherNet/IP✞	ControlNet	DeviceNet❄	RS-232 (DF1)	DH-485
9355 RSLinx software	yes	yes	yes	yes	yes
1784-KTC, -KTCx, -KTCx15, -PCIC(S), -PCC	na	na	na	na	na
1784-PCIDS, -PCD	na	na	yes	na	na
1788-CN2DN	na	na	yes	na	na
1788-EN2DN	yes	yes	yes	na	na
1788-CN2FF	na	na	na	na	na
1203-CN1 ControlNet module‡	na	na	na	na	na
1203-FM1/FB1 SCANport§	na	na	na	na	na

✞A non-EtherNet/IP CompactLogix controller requires a 1761-NET-ENI interface to connect to an EtherNet/IP network. This interface is only a messaging bridge.
❄For DeviceNet access, use either a 1769-SDN scanner (control I/O and send/receive messages) or a 1761-NET-DNI interface (messaging bridge).
‡Use the generic module configuration to configure the 1203-CN1 module and a CIP generic MSG instruction to communicate with the module.
§Use a CIP generic MSG instruction to communicate with the 1203-FM1 SCANport module on a DIN rail that is remote to the controller. The remote DIN rail also requires a 1794-ACN(R)15 ControlNet adapter module.

Program Equipment Phases

The PhaseManager option of RSLogix 5000 software gives you a state model for your equipment. It includes the following components:

- phase to run the state model
- equipment phase instructions for programming the phase
- PHASE data type to link the phase to other equipment and higher-level systems

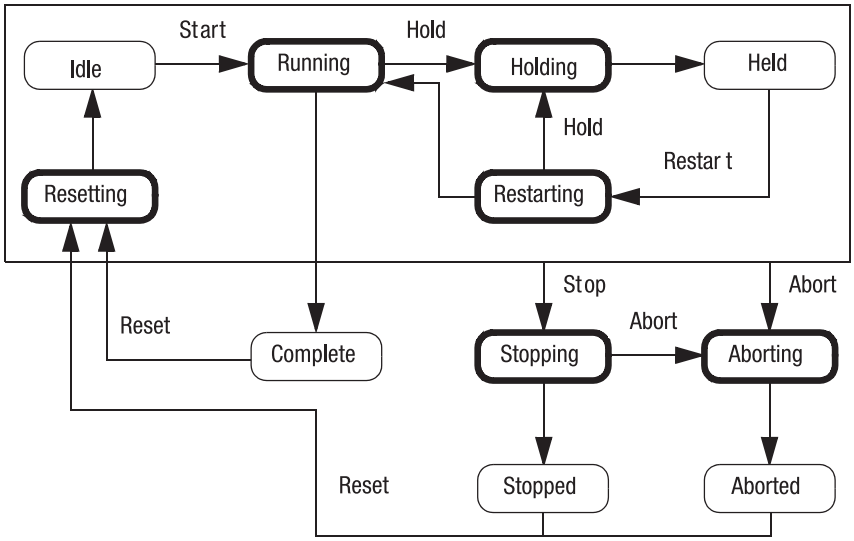
PhaseManager uses the following states:

Acting

Acting states represent the things your equipment does at a given time.

Waiting

Waiting states represent the condition of your equipment when it is in-between acting states.



To develop PhaseManager programs, you need:

- Logix5000 controller with firmware revision 15.0 or later
- communication path to the controller
- RSLogix 5000 software version 15.0 or later

How a Logix System Uses Connections

A Logix system uses a connection to establish a communication link between two devices. Connections can be:

- controller to local I/O modules or local communication modules
- controller to remote I/O or remote communication modules
- controller to remote I/O (rack-optimized) modules
- produced and consumed tags
- messages

You indirectly determine the number of connections the controller uses by configuring the controller to communicate with other devices in the system. Connections are allocations of resources that provide more reliable communications between devices than unconnected messages.

Method	Description
scheduled connection • level of determinism • unique to ControlNet	A scheduled connection is unique to ControlNet communications. A scheduled connection lets you send and receive data repeatedly at a predetermined interval, which is the requested packet interval (RPI). For example, a connection to an I/O module is a scheduled connection because you repeatedly receive data from the module at a specified interval. Other scheduled connections include connections to: • communication devices • produced/consumed tags On a ControlNet network, you must use RSNetWorx for ControlNet to enable all scheduled connections and establish a network update time (NUT).
unscheduled connection • deterministic • used by both ControlNet and EtherNet/IP	An unscheduled connection is a message transfer between controllers that is triggered by the requested packet interval (RPI) or the program (such as a MSG instruction). Unscheduled messaging lets you send and receive data when needed. All EtherNet/IP connections are unscheduled.
unconnected message • least deterministic	An unconnected message is a message that does not require connection resources. An unconnected message is sent as a single request/response.

The controller you select determines the connections for I/O and messages.

This controller:	Supports this number of connections:
1769-L32C, -L35CR	32 connections (all of which can be scheduled)
1769-L32E, -L35E	32 connections (all 32 connections are unscheduled)

Determine Connections for I/O Modules

A Logix system uses connections to transmit I/O data. These connections can be direct connections or rack-optimized connections.

Connection	Description
direct	A direct connection is a real-time, data transfer link between the controller and an I/O module. The controller maintains and monitors the connection between the controller and the I/O module. Any break in the connection, such as a module fault or the removal of a module while under power, causes the controller to set fault status bits in the data area associated with the module. Typically, analog I/O modules and specialty modules require direct connections.
rack-optimized	For digital I/O modules, you can select rack-optimized communication. A rack-optimized connection consolidates connection usage between the controller and all the digital I/O modules on a rack (or DIN rail). Rather than having individual, direct connections for each I/O module, there is one connection for the entire rack (or DIN rail).

Determine Connections for Produced and Consumed Tags

The controller supports the ability to produce (broadcast) and consume (receive) system-shared tags over ControlNet or EtherNet/IP networks. Produced and consumed tags each require connections. Over ControlNet, produced and consumed tags are scheduled connections.

This type of tag:	Requires these connections:
produced	A produced tag allows other controllers to consume the tag, which means that a controller can receive the tag data from another controller. The local controller (producing) uses one connection for the produced tag and one connection for each consumer. The controller's communication device uses one connection for each consumer. As you increase the number of controllers that can consume a produced tag, you also reduce the number of connections the controller and communication device have available for other operations, like communications and I/O.
consumed	Each consumed tag requires one connection for the controller that is consuming the tag. The controller's communication device uses one connection for each consumer.

For two controllers to share produced or consumed tags, both controllers must be attached to the same control network (such as a ControlNet or Ethernet/IP network). You cannot bridge produced and consumed tags over two networks.

The total number of tags that can be produced or consumed is limited by the number of available connections. If the controller uses all of its connections for I/O and communication devices, no connections are left for produced and consumed tags.

Determine Connections for Messages

Messages transfer data to other devices, such as other controllers or operator interfaces. Some messages use unscheduled connections to send or receive data. These connected messages can leave the connection open (cache) or close the connection when the message is done transmitting. The following table shows which messages use a connection and whether or not you can cache the connection:

This type of message:	Using this communication method:	Uses a connection:
CIP data table read or write	CIP	✓
PLC-2, PLC-3, PLC-5, or SLC (all types)	CIP	
	CIP with Source ID	
	DH+	✓
CIP generic	CIP	your option[1]
block-transfer read or write	na	✓

[1] You can connect CIP generic messages, but for most applications we recommend you leave CIP generic messages unconnected.

Connected messages are unscheduled connections on both ControlNet and EtherNet/IP networks.

Each message uses one connection, regardless of how many devices are in the message path. To conserve connections, you can configure one message to read from or write to multiple devices.

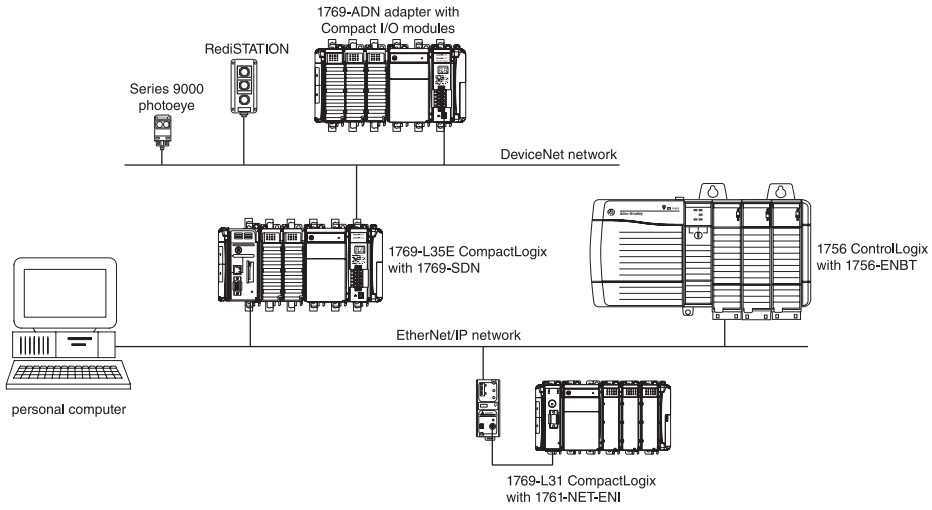
If a message executes repeatedly, cache the connection. This keeps the connection open and optimizes execution time. Opening a connection each time the message executes increases execution time.

If a message executes infrequently, do not cache the connection. This closes the connection upon completion of the message, which frees up that connection for other uses.

Connections Example

In this example system the 1769-L35E controller:

- sends and receives messages to/from the 1756 ControlLogix controller and the 1769-L31 controller over EtherNet/IP
- controls remote I/O devices on DeviceNet
- produces one tag that the 1756 ControlLogix controller consumes
- is programmed via RSLogix 5000 programming software



The 1769-L35E controller in this example uses these connections:

Connection Type	Module Quantity	Connections per Module	Total Connections
controller to RSLogix 5000 programming software	1	1	1
message to 1756 ControlLogix controller	1	1	1
message to 1769-L31 controller	1	1	1
controller to 1769-SDN	1	2✞	2
produced tag consumed by 1756 ControlLogix controller	1	1	1
total			6

✞The controller uses 2 connections for a 1769-SDN module - one for communications to the controller and one for data.

Determine Total Connection Requirements

The total connection requirements for a CompactLogix system include both local and remote connections. Tallying local controller connections is not an issue because the controller supports the maximum number of I/O modules. It is important to tally remote connections because the controller supports different amounts of connections over different networks.

Connection Type	Device Quantity	Connections per Device	Total Connections
remote EtherNet/IP communication module configured as direct (none) configured as rack-optimized		0 **or** 1	
remote I/O module over EtherNet/IP (direct connection)		1	
remote ControlNet communication module configured as direct (none) configured as rack-optimized		0 **or** 1	
remote I/O module over ControlNet (direct connection)		1	
remote device over DeviceNet (accounted for in rack-optimized connection for local 1769-SDN module)		0	
produced tag		0	
each consumer		1	
consumed tag		1	
cached message		1	
total			

Step 4 - Select:

- *if power consumption exceeds the maximum for a single power supply, install additional banks and power supplies*

Select Power Supplies

Compact I/O power supplies distribute power from either side of the power supply. For example, a 2A at 5V dc power supply (1769-PA2, -PB2) can provide 1A to the right side of the power supply and 1A to the left. A 4A at 5V dc power supply (1769-PA4, -PB4) can provide 2A to the right side of the power supply and 2A to the left.

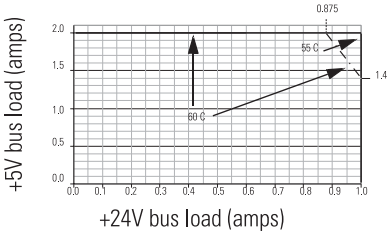
Specification	1769-PA2	1769-PB2	1769-PA4	1769-PB4
Description	Compact 124/240V ac Expansion Power Supply	Compact 24V dc Expansion Power Supply	Compact 124/240V ac Expansion Power Supply	Compact 24V dc Expansion Power Supply
Operating Voltage Range	85…265V ac (wide range; no jumper or DIP switch required), 47…63 Hz	19.2…31.2V dc	85…132V ac or 170…265V ac (switch selectable), 47…63 Hz	19.2…32V dc
Power Consumption, Max.	100 VA @ 120V ac 130 VA @ 240V ac	50 VA @ 24V dc	200 VA @ 120V ac 240 VA @ 240V ac	100 VA @ 24V dc
Current Capacity (Amps) at 5V	2.0 A✞		4.0 A❄	
Current Capacity (Amps) at 24V	0.8 A‡		2.0 A§	
24V dc User Power Capacity (0° to 55°C)	250 mA	—	—	—
Inrush Current, Max.	25 A @ 132V ac 10 Ω source impedance 40 A @ 265V ac 10 Ω source impedance	30 A @ 31.2V dc	25 A @ 132V ac 10 Ω source impedance 40 A @ 265V ac 10 Ω source impedance	30 A @ 31.2V dc
Line Loss Ride Through	10 ms…10 s		5 ms…10 s	
Short Circuit Protection (Yes/No)	Front Access Fuse (replacement part number: Wickmann 19195-3.15A, Wickmann 19343-1.6A, or Wickmann 19181-4A)	Front Access Fuse (replacement part number: Wickmann 19193-6.3A)	Front Access Fuse (replacement part number: Wickmann 19195-3.15A or Wickmann 19181-4A)	Front Access Fuse (replacement part number: Wickmann 19193-6.3A)
Overvoltage Protection	for both +5V dc and for +24V dc			
Isolation Voltage	Verify by one of the following tests: 1836V ac for 1s or 2596V dc for 1s 265V Working Voltage (IEC Class 1 - grounding required)	Verify by one of the following tests: 1200V ac for 1s or 1697V dc for 1s 75V Working Voltage (IEC Class 1 - grounding required)	Verify by one of the following tests: 1836V ac for 1s or 2596V dc for 1s 265V Working Voltage (IEC Class 1 - grounding required)	Verify by one of the following tests: 1200V ac for 1s or 1697V dc for 1s 75V Working Voltage (IEC Class 1 - grounding required)
Power Supply Distance Rating	8 modules♣↗			

Certifications: UL 508, CSA (Class I, Division 2, Group A, B, C, D), CE

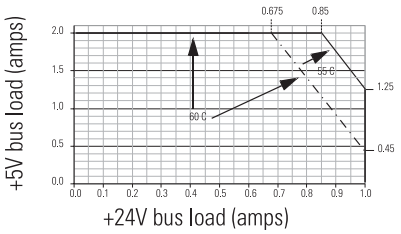
Power Requirements and Transformer Sizing

1769-PA2 output derating

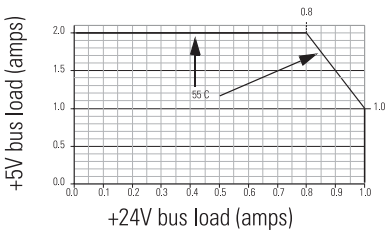
user +24V current draw at 0A



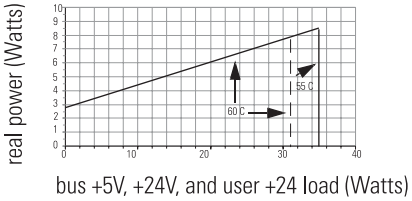
user +24V current draw at 0.2A



user +24V current draw at 0.25A

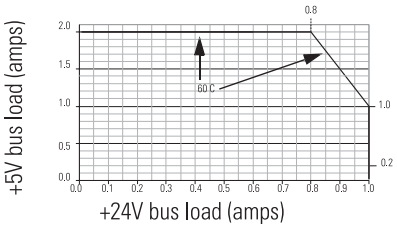


1769-PA2 power dissipation

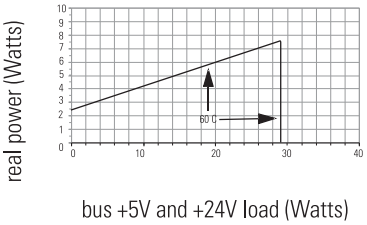


1769-PB2 output derating

total output: 29W @ 60˚C or below

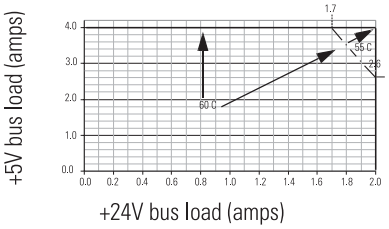


1769-PB2 power dissipation



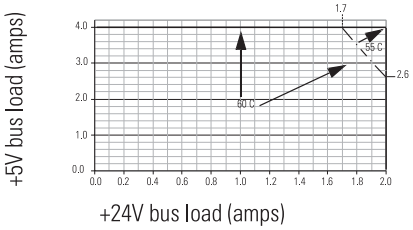
1769-PA4 output derating

total output: 68W @ 55˚C or below
61W @ 60˚C or below

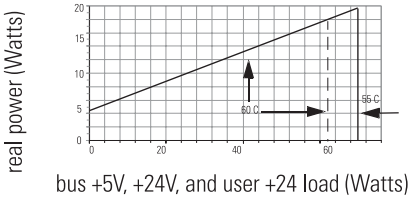


1769-PB4 output derating

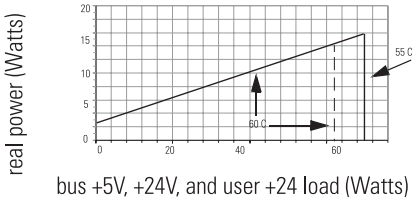
total output: 68W @ 55˚C or below
61W @ 60˚C or below



1769-PA4 power dissipation



1769-PB4 power dissipation



Step 5 - Select:

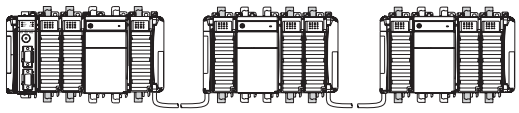
- *panel mount or DIN rail mount*
- *appropriate number of panels or DIN rails based on the number of modules and the physical location*
- *one end cap per controller system*

Mount the CompactLogix System

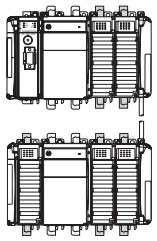
You can panel mount or DIN-rail mount a CompactLogix system. The CompactLogix system must be mounted so that the modules are horizontal to each other.

If you separate modules into multiple banks, the banks can be vertical or horizontal to each other.

Horizontal Orientation



Vertical Orientation



If you decide to use a DIN rail, use steel, 35 x 7.55mm DIN rails (A-B part number 199-DR1; 46277-3; EN 50022). The DIN rails for all CompactLogix system components must be mounted on a common, conductive surface to ensure proper electromagnetic interference (EMI) performance.

Ground the system

You can ground a CompactLogix system through the:

- non-coated, steel DIN rail
- panel-mount screw hole containing the ground strap

Power supply distance rating

Modules can be placed to the left and the right of the power supply. As many as eight I/O modules can be placed on each side of the power supply.

Each 1769 module also has a power supply distance rating (the number of modules from the power supply). Each module must be located within its distance rating. See the specifications for the module to determine its distance rating.

The CompactLogix controller has a power supply distance rating of 4 modules. The controller must be the leftmost module in the first bank of the system. The maximum configuration for the first bank of a CompactLogix controller is the controller and 3 I/O modules to the left of the power supply and 8 I/O modules to the right of the power supply.

Divide I/O modules into separate banks

The controller is the leftmost module in the CompactLogix system. The controller has built-in termination, so the leftmost end of the system is terminated.

The final I/O bank in the CompactLogix system needs an end cap on the end without the expansion cable.

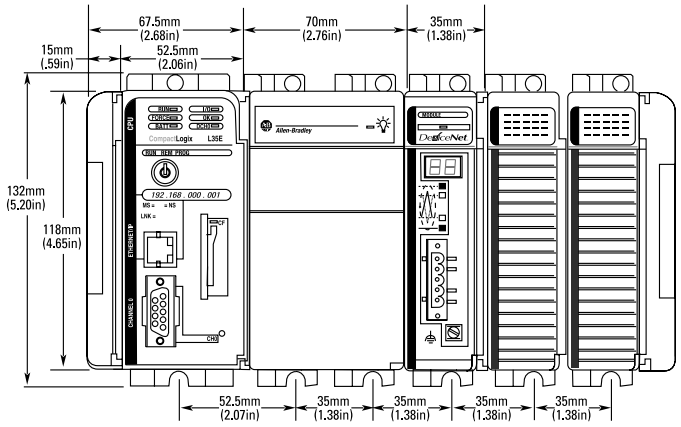
If you divide the modules into multiple banks:

- the controller must be in the leftmost position of the first bank
- each bank needs its own power supply
- use expansion cables to connect the banks
- the last I/O bank requires an end cap

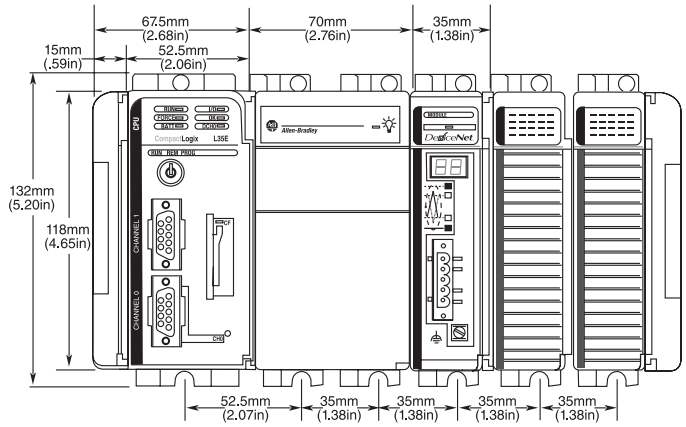
If you add a:	And connect the chassis :	Use this cable:✞
second bank	right to left	1769-CRLx
	right to right	1769-CRRx
third bank	right to left	1769-CRLx
	right to right	1769CRRx
	left to left	1769-CLLx

✞Where x = 1 for 1 ft. (305 mm) or 3 for 3.28 ft. (1 m)

1769-L32x, 1769-L35x CompactLogix Controller Dimensions



1769-L31 CompactLogix Controller Dimensions



Step 6 - Select:

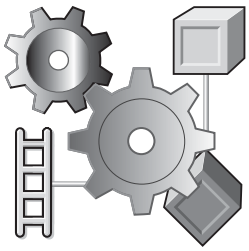
- *the appropriate package of RSLogix 5000 Enterprise Series software and any options*
- *other software packages for your application*

Select Software

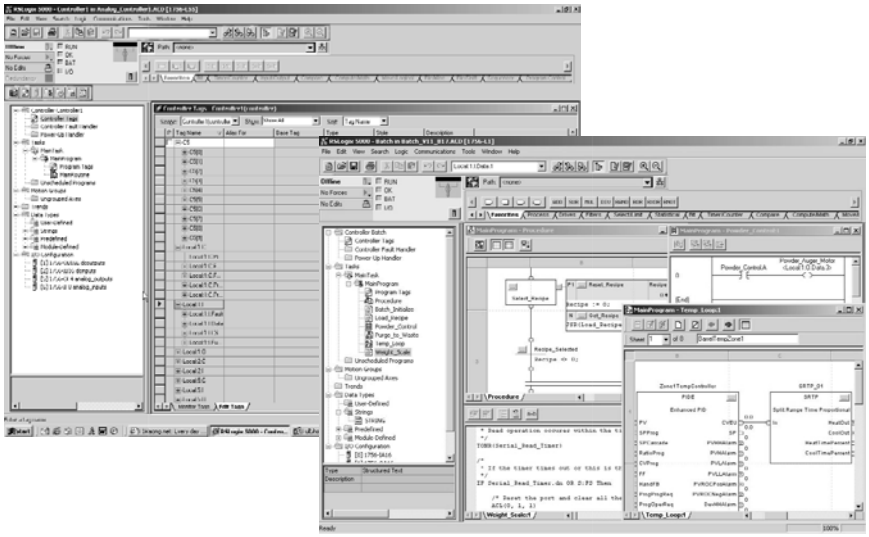
Your selection of modules and network configuration determines what software packages you need to configure and program your system.

If you have a:	You need:	Order this catalog number:
1769 CompactLogix controller	RSLogix 5000 Enterprise Series software	9324 series (RSLogix 5000 Enterprise Series software)
EtherNet/IP interface (set the IP address)	RSLinx software (RSLinx Lite and Bootp server come with RSLogix 5000 Enterprise Series software) **or** RSNetWorx for EtherNet/IP (comes with the standard/NetWorx option of RSLogix 5000 Enterprise Series software)	9324 series (RSLogix 5000 Enterprise Series software) **or** 9324-RLD300NXENE (RSLogix 5000 Enterprise Series software plus RSNetWorx option) **or** 9357-ENETL3 (RSNetWorx for EtherNet/IP)
ControlNet interface	RSNetWorx for ControlNet (comes with the standard/NetWorx option of RSLogix 5000 Enterprise Series software)	9324-RLD300NXENE (RSLogix 5000 Enterprise Series software plus RSNetWorx option) **or** 9357-CNETL3 (RSNetWorx for ControlNet)
DeviceNet interface	RSNetWorx for DeviceNet (comes with the standard/NetWorx option of RSLogix 5000 Enterprise Series software)	9324-RLD300NXENE (RSLogix 5000 Enterprise Series software plus RSNetWorx option) **or** 9357-DNETL3 (RSNetWorx for DeviceNet)
communication card in a workstation	RSLinx software (RSLinx Lite comes with RSLogix 5000 Enterprise Series software)	9324 series (RSLogix 5000 Enterprise Series software)
Logix-based system you want to emulate	RSLogix Emulate 5000	9310-WED200ENE
operator interface	RSView Enterprise series software	ViewAnyWare products

Programming Software



RSLogix 5000 Enterprise Series software is designed to work with Rockwell Automation's Logix platforms. RSLogix 5000 Enterprise Series software is an IEC 61131-3 compliant software package that offers relay ladder, structured text, function block diagram, and sequential function chart editors for you to develop application programs. RSLogix 5000 Enterprise Series software also includes axis configuration and programming support for motion control.



RSLogix 5000 Enterprise Series software requirements

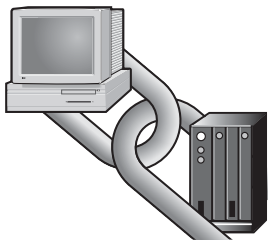
Description	Value
personal computer	Pentium II 450 MHz minimum Pentium III 733 MHz (or better) recommended
software requirements	Supported operating systems: • Microsoft Windows XP Professional version 2002 (with Service Pack 1 or 2) or XP Home version 2002 • Microsoft Windows 2000 Professional with Service Pack 1, 2, or 3 • Microsoft Windows Server 2003
RAM	128 Mbytes of RAM minimum 256 Mbytes of RAM recommended
hard disk space	100 Mbytes of free hard disk space (or more based on application requirements)
video requirements	256-color VGA graphics adapter 800 x 600 minimum resolution (True Color 1024 x 768 recommended)

Select the programming package

Available Features	Service Edition 9324-RLD000xxE✞❄	Mini Edition 9324-RLD200xxE✞	Lite Edition 9324-RLD250xxE✞✦	Standard Edition 9324-RLD300xxE✞	Standard/ NetWorx Edition 9324-RLD300NXxxE✞♣	Full Edition 9324-RLD600xxE✞‡	Professional Edition 9324-RLD700NXxxE✞♣
Logix5000 controllers supported	all	CompactLogix FlexLogix	CompactLogix FlexLogix	all	all	all	all
Relay ladder diagram editor§	view only	fully supported	fully supported	fully supported	fully supported	fully supported	fully supported
Function block diagram editor 9324-RLDFBDENE§	view only	upload/download only editor available separately	fully supported	upload/download only editor available separately	upload/download only editor available separately	fully supported	fully supported
Sequential function chart editor 9324-RLDSFCE§	view only	upload/download only editor available separately	fully supported	upload/download only editor available separately	upload/download only editor available separately	fully supported	fully supported
Structured text editor 9324-RLDSTXE§	view only	upload/download only editor available separately	fully supported	upload/download only editor available separately	upload/download only editor available separately	fully supported	fully supported
PhaseManager 9324-RLDPMENE❖	view only	available separately	available separately	available separately	available separately	included	included
Highly-integrated motion	view only	upload/download only	upload/download only	fully supported	fully supported	fully supported	fully supported
Graphical trending	fully supported	fully supported❖	fully supported❖	fully supported	fully supported	fully supported	fully supported
DriveExecutive™ Lite 9303-4DTE01ENE	available separately	available separately	available separately	included	included	included	included
PIDE autotune 9323-ATUNEENE	available separately	available separately	available separately	available separately	available separately	available separately	included
RSLogix Architect 9326-LGXARCHENE❖	available separately	available separately	available separately	available separately	available separately	available separately	included
RSLogix Emulate 5000 and RSTestStand Lite 9310-WED200ENE	available separately	na	na	available separately	available separately	available separately	included
RSMACC audit support	na	na	na	na	na	na	available separately
Logix CPU security tool	included	included	included	included	included	included	included
Routine source protection tool	included	included	included	included	included	included	included
RSMACC authenticate (security server) client	included	included	included	included	included	included	included
Standalone security server explorer	included	included	included	included	included	included	included
RSLinx	Lite included	Lite included	Lite included	Lite included	Lite included	Lite included	Professional included♣
RSNetWorx for ControlNet RSNetWorx for DeviceNet RSNetWorx for EtherNet/IP↗	available separately	available separately	available separately	available separately	included	available separately	included♣
FBD ActiveX faceplates	included	included	included	included	included	included	included
Tag data upload/download tool	included	included	included	included	included	included	included
RSLogix 5000 project compare tool	included	included	included	included	included	included	included
Tag custom data monitor tool	included	included	included	included	included	included	included
RSView demo (50 tags/2 hours)	available separately	available separately	available separately	available separately	available separately	available separately	included
Upgrades	to Standard: 9324-RLD0U3xxE to Full: 9324-RLD0U6xxE to Professional: 9324-RLD0U7xxE	to Standard: 9324-RLD2U3xxE to Professional: 9324-RLD2U7xxE	to Full: 9324-RLD25U6xxE to Professional: 9324-RLD25U7xxE	to Professional: 9324-RLD3U7xxE to Full: multi-language pack⌘	na	to Professional: 9324-RLD6U7xxE	na

✞Replace "xx" in the catalog number with the appropriate language designation: EN=English, FR=French, DE=German, IT=Italian, PT=Portuguese, and ES=Spanish.
❄As of RSLogix 5000 programming software version 12.
‡As of RSLogix 5000 programming software version 10.02.
§A multiple language editor package is available as 9324-RLDMLPE. It contains the function block, sequential function chart, and structured text editors at a reduced price.
♣To run RSLinx Professional on a PC, the RSLogix 5000 Professional activation key must be installed on the PC's hard drive. RSLinx will start in Lite mode if the RSLogix Professional activation key is installed on a different drive (i.e, floppy drive, or network drive).
↗RSNetWorx for ControlNet is available as 9357-CNETL3. RSNetWorx for DeviceNet is available as 9357-DNETL3. RSNetWorx for EtherNet/IP is available as 9357-ENETL3. They are available together as 9357-ANETL3.
⌘The multiple language editor package (9324-RLDMLPE) is not the same as an upgrade, but it extends the programming languages to match those in a Full package.
✦This package includes two activation keys: one for the Mini Edition (9324-RLD200xxE) and the other for the multiple language editor (9324-RLDMLPE)
❖As of RSLogix 5000 programming software version 15

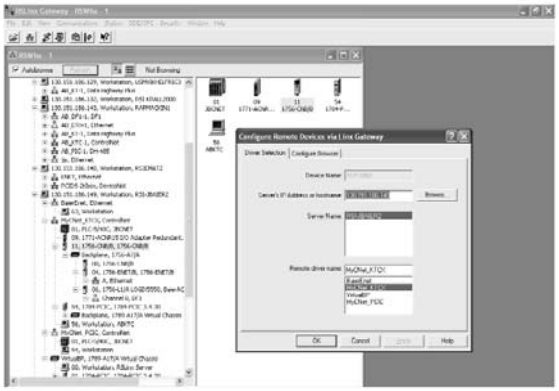
RSLinx Software



RSLinx software (9355 series) is a communication server package that provides plant-floor device connectivity for a wide variety of applications. RSLinx can support multiple software applications simultaneously communicating to a variety of devices on many different networks.

RSLinx provides a user-friendly graphical interface for navigating through your network. Select a device and click to access a variety of integrated configuration and monitoring tools. A complete set of communication drivers is provided for your networking needs, including legacy Allen-Bradley networks.

RSLinx is available in multiple packages to meet the demand for a variety of cost and functionality requirements.

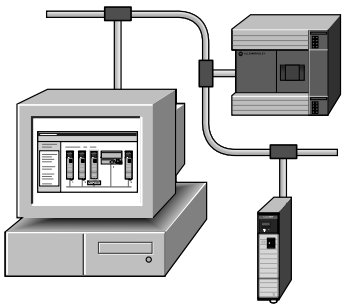


RSLinx system requirements

Description	Value
personal computer	Pentium100 MHz processor (faster processors will improve performance)
operating system	Supported operating systems: • Microsoft Windows XP • Microsoft Windows 2000 • Microsoft Windows NT version 4.0 with Service Pack 3 or greater • Microsoft Windows ME • Microsoft Windows 98
RAM	32 Mbytes of RAM minimum 64 Mbytes or more of RAM recommended
hard disk space	35 Mbytes of free hard disk space (or more based on application requirements)
video requirements	16-color VGA graphics display 800 x 600 or greater resolution

In most cases, RSLinx Lite software comes bundled with controller programming software packages.

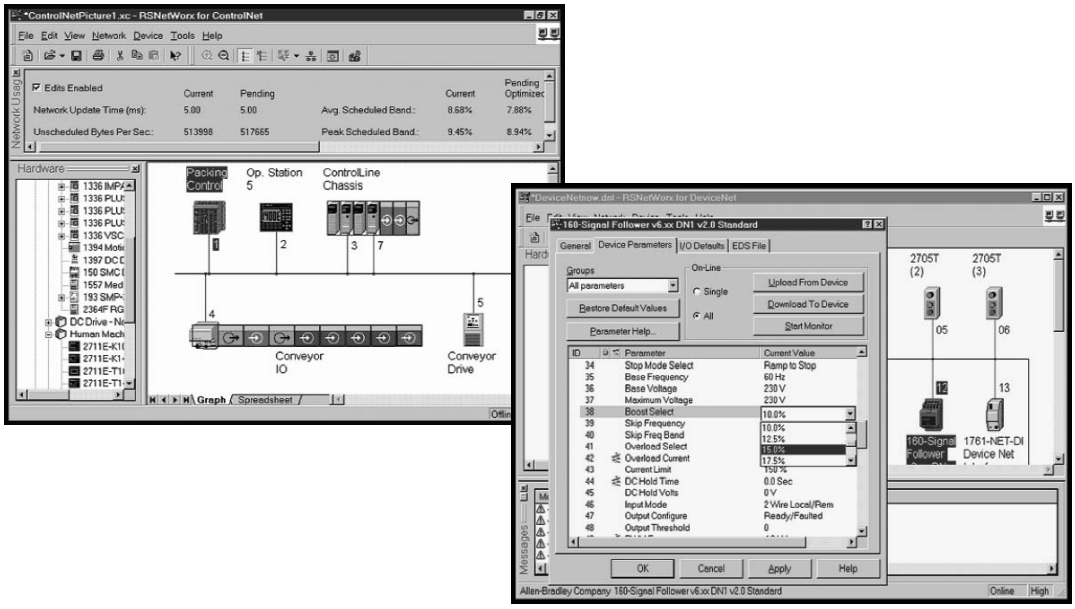
Network Configuration Software



RSNetWorx software is the configuration tool for your control network. With RSNetWorx software you can create a graphical representation of your network configuration and configure the parameters that define your network.

Use RSNetWorx for:

- ControlNet to schedule network components. The software automatically calculates network bandwidth for the entire network, as well as the bandwidth used by each network component. You must have RSNetWorx software to configure and schedule ControlNet networks.
- DeviceNet to configure DeviceNet I/O devices and create a scan list. The DeviceNet scanner stores the configuration information and scan list.
- EtherNet/IP to configure EtherNet/IP devices using IP addresses or host names.



RSNetWorx system requirements

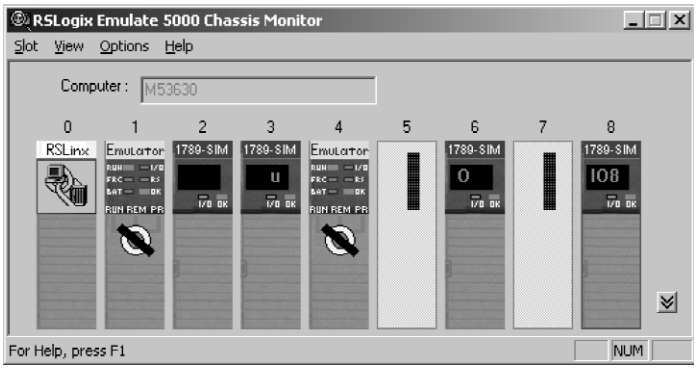
Description	ControlNet	DeviceNet	EtherNet/IP
personal computer	Intel Pentium or Pentium-compatible computer		
operating system	Supported operating systems: • Microsoft Windows XP • Microsoft Windows 2000 • Microsoft Windows 2000 Terminal Server • Microsoft Windows NT version 4.0 with Service Pack 6 or greater • Microsoft Windows ME • Microsoft Windows 98		
RAM	32 Mbytes of RAM minimum more memory is required for large networks		
hard disk space	minimum: 115 Mbytes (includes program files and hardware files) full support: 168...193 Mbytes (includes program files, online help, tutorial, and hardware files)	minimum: 190 Mbytes (includes program files and hardware files) full support: 230...565 Mbytes (includes program files, online help, tutorial, and hardware files)	minimum: 108 Mbytes (includes program files and hardware files) full support: 115...125 Mbytes (includes program files, online help, tutorial, and hardware files)
video requirements	16-color VGA graphics adapter 640 x 480 resolution minimum 800 x 600 resolution recommended		
other	RSLinx Lite 2.4 or later to use RSNetWorx online	RSLinx Lite 2.4 or later to use RSNetWorx online	RSLinx Lite 2.41 or later to use RSNetWorx online

In most cases, RSNetWorx software comes bundled with controller programming software packages.

RSLogix Emulate 5000 Software

RSLogix Emulate 5000 (9310-WED200ENE) is the software emulation package for the Logix5000 controllers. RSLogix Emulate 5000 used in conjunction with RSLogix 5000 software lets you run and debug your application code while at your computer. In addition, RSLogix Emulate 5000 also lets you test HMI screens, developed in RSView for example, without the need to connect to a real controller.

You can set tracepoint and breakpoint instructions (ladder diagram only) in your application code, use traces, and also vary the execution speed of the emulator. RSLogix Emulate 5000 supports all the programming languages (ladder diagram, function block diagram, structured text, and sequential function chart). RSLogix Emulate 5000 does not allow for control of real I/O.



RSLogix Emulate 5000 system requirements

Description	Value
personal computer	IBM-compatible Intel Pentium II 300 MHz or Celeron 300A (Pentium III 600 MHz recommended)
operating system	Supported operating systems: • Microsoft Windows XP with Service Pack 1or greater • Microsoft Windows 2000 with Service Pack 2 or greater • Microsoft Windows NT version 4.0 with Service Pack 6A or greater
RAM	128 Mbytes of RAM minimum
hard disk space	50 Mbytes of free hard disk space
video requirements	16-color VGA graphics display 800 x 600 or greater resolution

RSLogix Emulate 5000 includes RSTestStand Lite. RSTestStand Lite lets you create virtual operator consoles that can help test your application code. RSTestStand Lite can be upgraded to the standard version by ordering catalog number 9310-TSTNDENE.

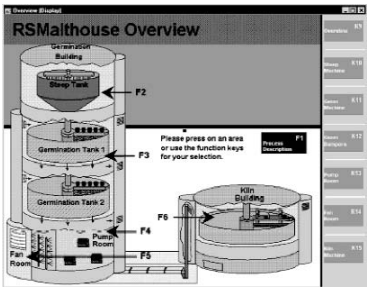
RSLogix Emulate 5000 and RSTestStand Lite are included with the RSLogix 5000 Professional edition.

ViewAnyWare

ViewAnyWare products, together with Logix for control and NetLinx architecture for communication, make up Rockwell Automation's Integrated Architecture strategy. The ViewAnyWare strategy combines Rockwell Automation's expertise in Allen-Bradley electronic operator interface and industrialized PC hardware with Rockwell Software's supervisory control software. Current ViewAnyWare products include:

- RSView Enterprise Series software
- PanelView Plus operator interface
- VersaView industrial computers and monitors
- VersaView CE industrial computer

RSView Enterprise Series software



RSView Enterprise Series from Rockwell Software is a line of HMI software products designed with a common look, feel, and navigation to help speed HMI application development and training time. With RSView Enterprise Series 3.0, you can reference existing Logix data tags. Any changes made to these referenced tags are automatically inherited by RSView. RSView Enterprise Series software includes:

- RSView Studio lets you create applications in a single design environment. It configures Supervisory Edition, Machine Edition, VersaView CE, and PanelView Plus. It supports editing and reusing projects for improved portability between embedded machine and supervisory HMI systems.
- RSView Machine Edition™ (ME) is a machine-level HMI product that supports both open and dedicated operator interface solutions. It provides a consistent operator interface across multiple platforms (including Microsoft Windows CE, Windows 2000/XP, and PanelView Plus solutions), and is ideal for monitoring and controlling individual machines or small processes.
- RSView Supervisory Edition™ (SE) is an HMI software for supervisory-level monitoring and control applications. It has a distributed and scalable architecture that supports distributed-server/multi-user applications. This highly scalable architecture can be applied to a stand-alone, one-server/one-user application or to multiple users interfacing with multiple servers.

RSView Enterprise Series Product Line	Cat. No.	Description
RSView Studio	9701-VWSTENE	RSView Studio for RSView Enterprise Series
	9701-VWSTMENE	RSView Studio for Machine Edition
RSView Machine Edition	9701-VWMR015AENE	RSView ME Station runtime for Windows 2000, 15 displays
	9701-VWMR030AENE	RSView ME Station runtime for Windows 2000, 30 displays
	9701-VWMR075AENE	RSView ME Station runtime for Windows 2000, 75 displays
RSView Supervisory Edition	9701-VWSCWAENE	RSView SE client
	9701-VWSCRAENE	RSView SE view client
	9701-VWSS025AENE	RSView SE server 25 displays
	9701-VWSS100AENE	RSView SE server 100 displays
	9701-VWSS250AENE	RSView SE server 250 displays
	9701-VWSS000AENE	RSView SE server unlimited display
	9701-VWB025AENE	RSView SE station 25 displays
	9701-VWB100AENE	RSView SE station 100 displays
	9701-VWB250AENE	RSView SE station 250 displays
	9701-VWSB000AENE	RSView SE station unlimited display

PanelView Plus operator interface

PanelView Plus is ideal for applications with a need to monitor, control, and display information graphically, allowing operators to quickly understand the status of their application. PanelView Plus is programmed with RSView Studio and has embedded RSView Machine Edition functionality. It combines the best features from the popular Allen-Bradley PanelView Standard and PanelView "e" operator interface products and adds new functionality including:

- multi-vendor communications
- trending
- expressions
- data logging
- animation
- RSView Studio direct browsing of RSLogix 5000 addresses

VersaView industrial computers and monitors

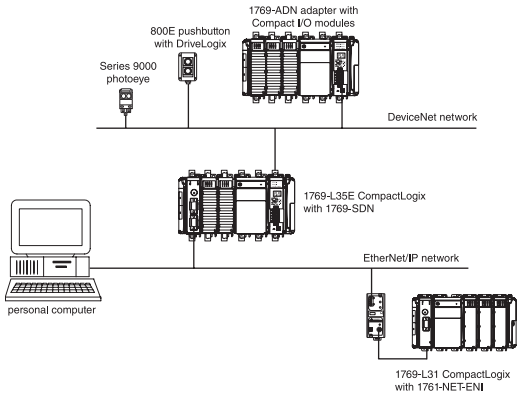
VersaView is a family of industrial computer and monitor solutions, comprised of integrated display computers, workstations, non-display computers and flat panel monitors. VersaView products offer effortless management of changing technology, a rugged but cost-effective design, and easier product configuration. All VersaView products provide the latest industrial solution available, optimized for visualization, control, information processing, and maintenance application.

VersaView CE industrial computers

VersaView CE is an open Windows CE terminal with a Windows desktop environment - bringing together features of operator interfaces and industrial computers. It is a high performance computer with a compact flash drive and integrated RSView Machine Edition runtime (no activation required). There's no hard disk, no fan, and no moving parts, which means maximum reliability on the plant floor. Easy to set up and maintain, VersaView CE means an open system that's rugged and economical, offering high functionality in an easy to use package.

Summary

Use a spreadsheet to record the amount and type of devices your CompactLogix system needs. For example, this sample system:



could result in this spreadsheet:

Controller 1 - 1769-L35E				
Device	**Number of Points Needed**	**Cat. No.**	**I/O Points per Module**	**Number of Modules**
120V ac digital inputs	12	1769-IA816	16	1
4-20mA analog inputs	3	1769-IF4XOF2	4	1
4-20mA analog outputs	2	1769-IF4XOF2	2	1 (part of same module from analog input requirements)
DeviceNet scanner	na	1769-SDN	na	1
DeviceNet adapter	na	1769-ADN	na	1
remote 24V dc digital outputs	30	1769-OB16	16	2
remote contact outputs	3	1769-OW6	6	1
Controller 1 subtotal				2 local 1769 I/O modules 1 1769-SDN 1 remote 1769-ADN 3 remote 1769 I/O modules

Controller 2 - 1769-L31				
Device	**Number of Points Needed**	**Cat. No.**	**I/O Points per Module**	**Number of Modules**
24V dc digital outputs	28	1769-OB16	16	2
high-speed counter	na	1769-HSC	na	1
EtherNet/IP interface devices	na	1761-NET-ENI	na	1
Controller 2 subtotal				3 I/O modules 1 1761-NET-ENI

As you select devices for your CompactLogix system, keep in mind:

✓	Step	Remember to Select
	1 Select I/O devices	• I/O modules • wiring system (if you want to use a wiring system instead of the terminal block that comes with module) • PanelConnect modules and cables if connecting input modules to sensors • expansion cables if planning multiple banks of I/O modules
	2 Select communication modules	• networks • communication interfaces • associated cable(s) and network equipment Some networks have companion documents to help you select the appropriate equipment. See your Rockwell Automation representative for information.
	3 Select controllers	• a controller with sufficient memory • a controller with sufficient performance and capacity • replacement batteries • a CompactFlash card
	4 Select power supplies	• if power consumption exceeds the maximum for a single power supply, install additional banks and power supplies
	5 Select the mounting requirements	• panel mount or DIN rail mount • appropriate number of panels or DIn rails based on the number of modules and the physical • one end cap per controller system
	6 Select software	• the appropriate package of RSLogix 5000 Enterprise Series software and any options • other software packages for your application

As you determine placement of the modules you selected, use the worksheets on the next pages to calculate power requirements and to record placement of modules. Make a copy of this worksheet for each controller.

Calculate system power requirements

Cat. No.	Number of Modules	Module Current Requirements (mA)		Calculated Current (mA) = (number of modules) x (module current requirements)	
		5V dc	24V dc	5V dc	24V dc
1769-ARM		60	0		
1769-ASCII		420	0		
1769-HSC		425	0		
1769-IA8I		90	0		
1769-IA16		115	0		
1769-IF4		120	60		
1769-IF4I		145	95		
1769-IF4XOF2		120	160		
1769-IF8		120	70		
1769-IM12		100	0		
1769-IQ16		115	0		
1769-IQ16F		110	0		
1769-IQ32		170	0		
1769-IQ32T		170‡	0		
1769-IQ6XOW4		105	50		
1769-IR6		100	45		
1769-IT6		100	40		
1769-OA8		145	0		
1769-OA16		225	0		
1769-OB8		145	0		
1769-OB16		200	0		
1769-OB16P		160	0		
1769-OB32		300	0		
1769-OF2		120	120		
1769-OF4CI		145	140		
1769-OF4VI		145	75		
1769-OF8C		145	160		
1769-OF8V		145	125		
1769-OV16		200	0		
1769-OV32T		200‡	0		
1769-OW8		125	100		
1769-OW8I		125	100		
1769-OW16		205	180		
1769-L35E		660	90		
1769-L35CR		680	40		
1769-L32E		660	90		
1769-L32C		680	40		
1769-L31		330	40		
1769-ADN		500	0		
1769-SDN		440	0		
1769-ECL		5	0		
1769-ECR		5	0		
Total Current Required:❄					

One 1769-ECL or 1769-ECR end cap/terminator is required in the system. The end cap/terminator used is dependent on your configuration.
❄The total current required must not exceed the power supply capacity listed below.
‡Preliminary

Power supply capacity

Specification	1769-PA2	1769-PB2	1769-PA4	1769-PB4
output current capacity (0° to 55° C)	2A @ 5V dc 0.8A @ 24V dc	2A @ 5V dc 0.8A @ 24V dc	4A @ 5V dc 2A @ 24V dc	4A @ 5V dc 2A @ 24V dc
24V dc user output capacity (0° to 55° C)	250mA	na	na	na

Record module placement

Use the following charts to record module placement. These charts have positions for the maximum number of modules in an I/O bank. The controller cannot necessarily support modules in all positions. Follow these guidelines as you place modules:

- The controller must be in the leftmost position in bank one. The controller has a power supply distance rating of 4 modules.
- The 1769-L32E, 1769-L32C, 1769-L35E, and 1769-L35CR controllers support 30 local I/O modules in as many as 3 I/O banks.
- The 1769-L31 controller support 16 local I/O modules in as many 3 I/O banks.
- Each I/O bank must have its own power supply.

Bank 1

Module	Placement (left or right of power supply)	Backplane Current @ 5 V (mA)	Backplane Current @ 24 V (mA)
1769-_____ controller	left		
	left		
	left		
	left		
1769-_____ power supply	__	—	—
	right		
	right		
	right		
	right		
	right		
	right		
	right		
	right		
1769-ECR right-end cap✞	right	—	—
Totals		mA	mA

✞You only need an end cap if this is the last bank in the system.

Bank 2

Module	Placement (left or right of power supply)	Backplane Current @ 5 V (mA)	Backplane Current @ 24 V (mA)
1769-_____ expansion cable	left or right	—	—
1769-_____ end cap✞	left or right	—	—
	left		
	left		
	left		
	left		
	left		
	left		
	left		
	left		
1769-_____ power supply	—	—	—
	right		
	right		
	right		
	right		
	right		
	right		
	right		
	right		
Totals		mA	mA

✞You only need an end cap if this is the last bank in the system. Place an end cap on the end opposite of the expansion cable.

Bank 3

Module	Placement (left or right of power supply)	Backplane Current @ 5 V (mA)	Backplane Current @ 24 V (mA)
1769-_____ expansion cable	left or right	—	—
1769-_____ end cap✞	left or right	—	—
	left		
	left		
	left		
	left		
	left		
	left		
	left		
	left		
1769-_____ power supply	—	—	—
	right		
	right		
	right		
	right		
	right		
	right		
	right		
	right		
Totals		mA	mA

✞Place an end cap on the end opposite of the expansion cable.

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